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STEREO

THE GERMAN MAGAZINE

ISSUE #9 2017

» **PREPARING A STATEMENT**

**We go beneath
the skin of Naim's
ultimate amps**

» **ALL-IN-ONE**

**Can one-box
streaming receivers
challenge separates?**

**REVIEWS: ATMO SFERA TURNTABLE, BOWERS & WILKINS
800 D3 SPEAKER, LINDEMANN MUSICBOOK:25DIGITAL PLAYER,
MATCHING SPEAKERS TO ROOMS – AND MORE!**



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THERE'S SPACE – EVEN IN THE SMALLEST SPACE!



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A hi-fi dealer once shared with me the opinion there's only one way a loudspeaker is too big for a room – when it doesn't fit through the door. I wouldn't go that far, but our great service topic "loudspeakers in rooms" discovered some interesting findings, one of which rocked the old familiar equation suggesting that small room = small loudspeakers and large room = large loudspeakers.

Yes, that 'received wisdom' can still be considered as a rough rule of thumb, but it really doesn't stand up to critical and detailed re-examination – and that's comforting for those without much space, but not content with compact boxes placed on stands. Yes, studio-livers, floorstanding speakers could be yours after all!

However, if in doubt, these HiFi fans should as ever put it to the test and look for the right solution for the available space with their dealer. Sometimes it helps to experiment with the installation and/or sitting position, but sometimes an intervention in the acoustics by means of room-treatment modules could be the ideal approach.

In any case, the fun of finding a tailor-made solution is almost guaranteed with an expert at your side. Be brave in the search for "your" loudspeaker dream – it might be more achievable than you think!

Michael Lang
editor@stereo-magazine.com

All prices listed in this magazine are German retail prices incl. VAT valid at the time of evaluation.

Return of an icon.

MIRACORD 90 ANNIVERSARY

ELAC Miracord remains an iconic name from the era of the long-playing disc.

Miracord 90 Anniversary
ELAC revisits a golden era with a turntable to mark its 90th birthday.



The motor is double-decoupled from the chassis and therefore from the tonearm by rubber dampers and fabric spiders that have proven themselves in ELAC speakers. The variable pitch control allows the speed to be varied by up to 5 %



The tonearm is manufactured in Germany and was developed exclusively for this ELAC turntable. An extremely light carbon tube forms the arm, while the remaining parts are made of aluminum and brass.



Aluminum platter weighing approximately 6.5 kg sits on a sub-platter whose hardened steel spindle rotates on an 8 mm ruby bearing. The spindle is axially guided in two sintered bronze bearing bushings.

LOOK, NO PLATTER!

Audio Deva's Atmo Sfera is a radical approach to turntable design: there's method behind what looks like madness



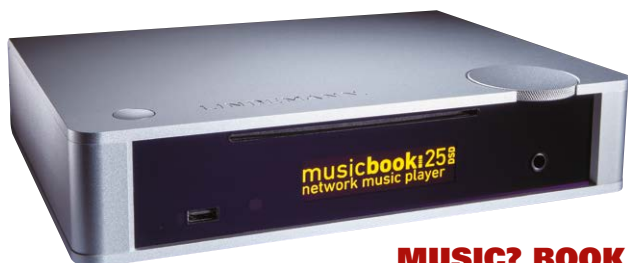
SYSTEMATIC THINKING

Can all-in-one systems from Musical Fidelity, Onkyo, Pioneer and T+A really replace separates?



STATEMENT OF INTENT

Naim's Statement amplifier points the way to the British company's future – we visit Salisbury to see it being made



MUSIC? BOOK HERE

We take a ticket for Lindemann's DSD-based approach to digital music. It's quite a ride...

SPACE TO BREATHE

Small speakers, small room; bigger boxes need more space – are these old rules there to be broken?



DIAMONDS: FOREVER?

The Bowers & Wilkins 800 Diamond Series flagship could be the last speaker you ever buy

LET'S PLAY TOPLESS



Something's missing – Audio Deva is constructing platterless record players. Is even that possible? Strictly in the interests of science, we invited two topless models into the studio

▲ Atmo Sfera works without a platter and tone arm lift, which is why the pickup has to be carefully placed by hand.

Crazy times, right? President Trump; iPhone7 with no headphone jack; and now the platterless record player. We were perplexed when the press release on Audio Deva's Vinyl Turntable "Atmo Sfera" came in: our reactions to the photo of the device from Italy swayed between incredulous amazement and amusement, all the way to a simple "What the ... is that?"

What looks like a design for a hidden camera TV sketch – "Where does the record go?" – is the result of a kickstart-er-funded project by Italian designer Paolo Caviglia, whose seriousness and serious appearance suggest he doesn't do jokes. A lover of classical music, who

evaluated Atmo Sfera during the development purely with orchestral pieces because these "cover the entire tonal and dynamic spectrum as well as mediating emotions", believes that the unpleasant resonances attributed to turntables and metal tonearms definitely impair hearing.

Using crowdfunding, he swiftly collected the capital for a turntable designed to be both different and better than usual: the platterless Atmo Sfera, in which the record lies only on a small aluminum cylinder and otherwise floats in the air. Can this work at all? To demonstrate, Caviglia and two of his turntables, as well as Ralf Nadolski from the new sales office – Authentic Sound, based in Worms –

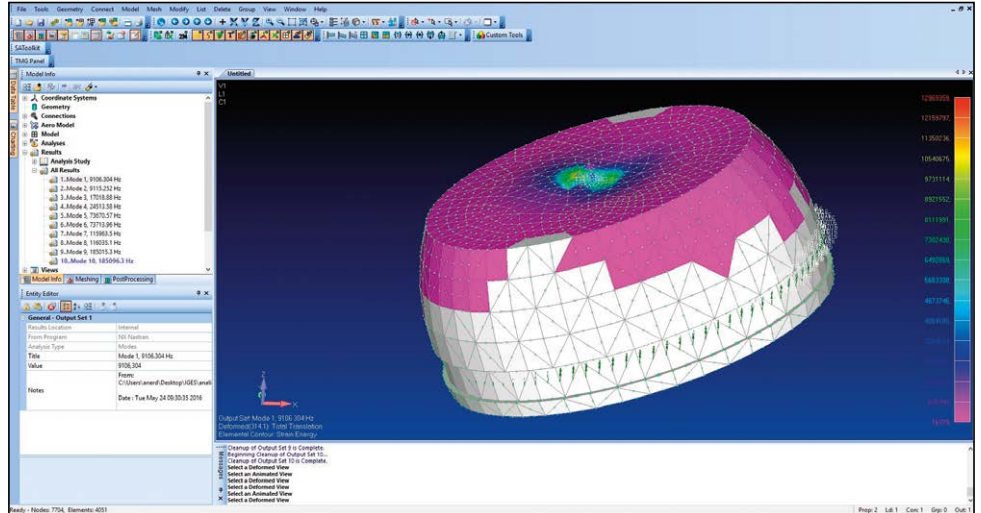
turned up in the editorial office.

Their two "high-end" line turntables were equipped with a carbon tonearm – there's also a "lifestyle" version with an aluminum arm, though according to the manufacturer this is only suitable for MM cartridges. For our sound tests the engineer had pre-assembled two Ortofon MCs, a Quintet bronze and a Cadenza Red, at 630 and 1100 euros respectively, which the sales department offer as packages for a special price. An external switching power supply was also included in the delivery.

Adjustment of the tracking force is achieved by pulling a weight out of the rear end of the arm and fixing it in place, though there's no gradation on this



▲ Paolo Caviglia is the co-founder and designer of Audio Deva. He visited us in the editorial office to present Atmo Sfera.



▲ The record is fixed with a clamp on the label-size surface of special aluminum. The motor is positioned close by; power supplies are external.

adjustment so a separate tonearm arm scale is required. Neither is there any point looking for an arm-lifter: the pick-up must be placed by hand and lifted off. When not in use, the arm rests in the rear holder. Almost disappointingly conventionally, two RCA jacks output the signals.

It is amazing how many considerations are contained in the Audio Deva: the manufacturer places utmost value on a defined vibration behavior of the panel system as well as the terminal and presents extensive graphics. Moreover, the whole system, which is available in various colors and is mounted on spring-loaded feet, is designed for low mass, which is intended to keep energy storage effects low and away from affecting the sound.

Rega's mastermind Roy Gandy could not have worded this more precisely.

During our review the Quintet Bronze model immediately showed a preference for rich tonal colors and a luminous fundamental range, so that orchestras actually came across pleasantly sonorous and strongly expressive. The bass appeared grippy, rich and well-differentiated, while singer/songwriter pieces also benefited from the homogenous, toothsome mid-range. Only with the lively opener from Diana Krall's "Live In Paris" album did the timing seem a little restrained compared with that of a conventional turntable of a similar price class.

This changed when we changed to the Cadenza Red-equipped Atmo Sfera. It played tighter and more crisply without

appearing nervous, sounded both more spacious and emotionally brighter, and produced a livelier, tingling musical "Atmo Sfera".

All this "topless" listening got us into a really good mood – now wonder the distributor is now looking for dealers for his charmingly attractive models.

Matthias Böde

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Mobile: (+39) 334 318 5000
www.audiodeva.com



▲ The finite element simulation of the vibratory behavior of the disk support suggests that these only occur at 9.1 kilohertz, while Audio Deva has detected record resonances at around 4 kHz, i.e. more than one octave below, so that no vibrations are transmitted.

ALL-IN-ONE SYSTEMS



Streamer, CD players, amplifiers, media servers, D/A converters and much more - the latest generation of all-in-one systems is more flexible than ever.

The hi-fi world is changing immensely. Completely new requirements have entered the scene with digital media, with new components developed to answer those needs, to the extent that what was once an all-in-one component combining CD player, radio tuner and amplifier – aka a CD receiver – is now firmly outdated. Now, systems need to be network-connected,

ideally support a few web streaming services, and should also offer DAC functionality for external digital sources – all the while being so cleverly designed and intuitive in use that inexperienced users don't feel daunted and confused.

Recent times have seen, many manufacturers mastering these requirements with flying colours, with our four test systems – from Musical Fidelity, Onkyo,

THE TEST CANDIDATES:	
PIONEER NC-50 DAB	€ 900
ONKYO C-755 / R-N 855	€ 1000
T + A R1000E	€ 4990

Pioneer and T + A combining a range of functionality which would have been unthinkable just a few years ago. So can these one-box solutions hold up against separates systems on sound? Or are they a compromise too far?

ALL ABOARD!



A complete system in one cabinet in hi-fi size: Pioneer's NC-50 DAB combines CD players, tuners, streamer and solid-state amplifiers under one roof

Finally there is a compact system in the grown-up full-size hi-fi size, at 43cm wide and packing in everything required nowadays to listen to music. For all that, Pioneer's NC-50 is very simple to use: you can flick through the various inputs and sources with one button, and if you choose 'network' as source, you can access various streaming services or the music on your home network, the respective selection menus being easily readable on the large graphic display.

Unfortunately, this display is largely unused for CD and radio operation: CD text or available/saved stations for FM/DAB+ could have been conveniently displayed here. Yes, RDS Radiotext data is displayed, but in tiny characters; however, while the album list for home network streaming is a bit plain, during playback

all-important information including album art does appear, even with WAV files.

Streaming via Remote App

The Pioneer Remote app for iOS and Android shows pretty much the same user interface, while its PushPlayer function can be used to stream songs stored locally on the device to the NC-50. The app lacks the ability to create playlists, but then specialist UPnP apps such as BubbleUPnP for Android can be used, even if the NC-50 doesn't appear in the list of renderers in the popular PlugPlayer app. Another alternative for playlists is the playback from the PC from the Windows Media Player with the „Play to“ function.

Songs stored on iOS devices can also be streamed via Airplay to the Pioneer system, but the NC-50 doesn't support direct

connection of iOS devices to the USB-A jacks – instead USB sticks or hard drives can be plugged in, navigated and their contents played.

In terms of sound formats and resolution, NC-50 is state-of-the-art: it accepts all lossless formats including Apple's AIFF and ALAC, at up to 24 bit and 192 kHz, as well as DSD files at up to quad DSD / DSD256 / 11.2 MHz, using the ESS Saber ES9016 converter chip. Unfortunately, DSD files offered by the Asset UPnP server software can't be played, although the NC-50 does work with the

Twonky server package, which makes it slightly confusing that the instruction manual says "WLAN playback of 88.2 kHz or higher, as well as DSD is not supported". While the WLAN range may fail in individual cases, NC-50 basically accepts these formats even via WLAN, also working on the -low-interference- 5 GHz WLAN band. However, those who listen a lot to higher-resolution music might to opt for wired network connection for stability, and to avoid buffering pauses.

KEYWORD

Renderer:

The DLNA standard distinguishes between the „Digital Media Player“ and „Digital Media Renderer“. While the renderer is dependent on an external „controller“ (e.g. a Smartphone app), the player also contains a navigation function.



Pivoting antennas, solid speaker terminals, inputs for line, phono and S/PDIF ▶

◀ Only the most important keys: clear Pioneer remote control



Even MP3 gapless

How does the NC-50 handle gapless music, from opera to live albums? Very well is the answer, even with MP3 files – well, unless the tracks are extremely short. This is an ability we have only found with streamers from the most sophisticated network specialists!

The Pioneer currently does not support Google Cast, but this is to be changed by firmware update, allowing music from cast-capable Smartphone apps to be forwarded to the NC-50, while the company is also promising to enable the FireConnect multiroom protocol.

Despite the extensive capabilities and componentry, the inside of the NC-50 is surprisingly tidy, with separate power supplies for the digital and analogue sections, including the Class D power amplification, and – despite the compact design – no need for a fan. The NC-50's build is top-class, with an aluminum front panel, a solid metal cover and, gold-plated connectors including the speaker terminals.

Both bass and treble controls are found in the menu, along with a three-position digital filter selector – in the listening tests we preferred the 'fast' setting, which was

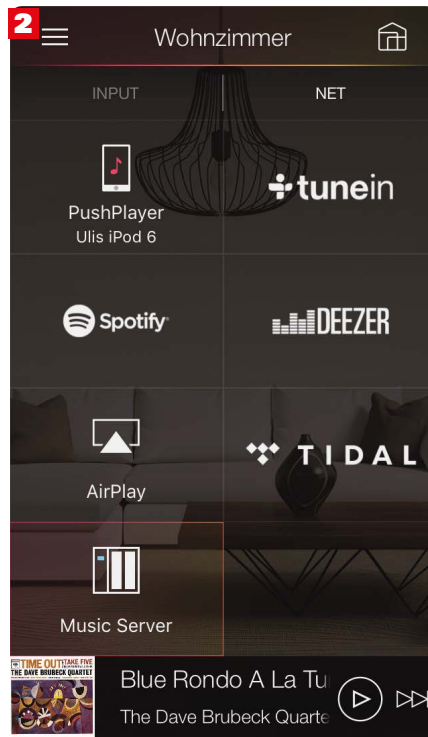
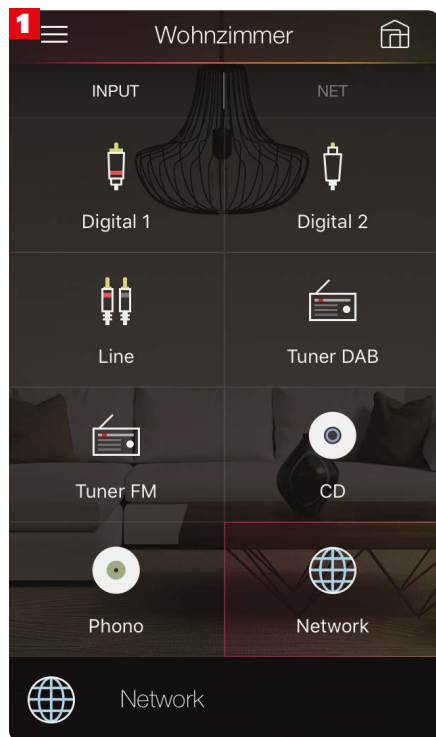
a bit crisper than the others.

Overall, the sound of the NC-50 is tonally balanced and pleasing, although not particularly spatial, and care must be taken with speaker selection: choose high-efficiency designs, or it will quickly reach its performance limits.

Ulrich Wienforth



In Pioneer's „Remote“ app, select the input (1), the streaming service, or the music from the home network (2). The sound format (including DSD) is also displayed (3). ▼

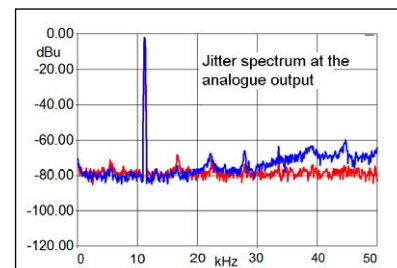


PIONEER NC-50 DAB

Price: around € 900
 Warranty: 2 years
 Dimensions: 43.5 x 10.5 x 32 cm (WxHxD)
 Colors: silver, black
 Contact: Pioneer
 Tel.: +49 8142/4208188
 www.pioneer.de

Conclusion: A good-quality all-in-one device, with all important functions: it's technically up-to-date, uses high-quality processing and has a compliant sound - but with limited performance.

MEASUREMENT RESULTS



Continuous power at	8 4 Ω 33 47 watts
Pulse power at	4 Ω 54 watts
Distortion factor at 50 mW 5 watts Pmax -1 dB	0.07 <0.01 <0.01%
Intermodulation at 50 mW 5 watts Pmax -1 dB	<0.01 <0.01 0.4%
Noise ratio CD Phono MM	73 69 dB
Damping factor at	4 Ω 50
Upper limit frequency (-3 dB, 4 Ω)	42 kHz
Standby consumption	0.2 watts

LAB COMMENTS: Increased noise values, which are hardly noticeable. Consistently low distortions. The phono input is quite insensitive, but the power reserves could be larger.

FEATURES

Interfaces: Phono-MM, Line in, S/PDIF optical and coax in, 2 x USB-A, antenna, LAN, WLAN-n with WPS, Bluetooth with AAC codec, 1 pair of speakers, headphones, subwoofer out, sound formats (via USB and home network): WAV/AIFF/FLAC/ALAC up to 24/192, DSD to 11.2 MHz, MP3/AAC/WMA, scope of delivery: remote control, T-antenna, English short instructions and evaluation

STEREO-TEST

SOUND QUALITY	80%
PRICE/PERFORMANCE	
★ ★ ★ ★ ☆	
VERY GOOD	

MP 3100 HV

The brilliant all-rounder



The MP 3100 HV is our latest and finest multi-source player. Its brilliant design philosophy enables the machine to reproduce virtually every imaginable source in totally High-End quality. It is equipped with an SACD / CD drive which is a completely new development, and also features our latest streaming client, an outstanding digital tuner offering FM, FM-HD and DAB+ capability, an aptX™ Bluetooth module and a digital input board with seven professional inputs. The converters are unique: DSD signals up to DSD 512 are converted in native form by the T+A True 1-Bit converter, while PCM signals up to 384 kSps are handled by the T+A double-differential quadruple converter.

The back panel shows that the MP 3100 HV is a true all-rounder: High-End analogue outputs in symmetrical (XLR) or asymmetrical (RCA) form, LAN, WLAN and USB ports, digital tuner, FD 100 radio remote control handset, Bluetooth aerial and Digital Connecting Board with seven inputs for external sources. There are separate mains sockets for analogue and digital mains sections.



T+A

A SMALLER STREAMER

Mini components, which are available individually, have a long tradition at Onkyo. Of course, the „separates“ can stream nowadays



Onkyo's offering in this comparison consists of the R-N 855 network receiver and its matching C-755 CD player – there's an optional pair of bookshelf speakers which, when bought with the player and receiver, will save you 50 euro. However, we're only dealing with the electronics here, and we're particularly interested in how similar the Onkyo receiver is to the all-in-one NC-50 from sister company Pioneer?

A look inside reveals that the network modules of the two devices are identical: they offer the same features, support the same file formats, resolutions and streaming services – and show the same little problems such as not appearing as UPnP renderers in the PlugPlayer app and not accepting DSD files from the Asset UPnP server.

The in-house apps are also identical. So you cannot create playlists in Onkyo's „Controller“ app, but you can stream the songs stored on the handheld to the R-N 855. And as with Pioneer, gapless playback of MP3 tracks from an external server is possible. The CD player can also be operated from the app, but only if it's connected to the receiver using a control cable as well as the usual analogue audio cables – however, this requires quite a few taps in the app.

Shared memory

Tuner control from the app is more comfortable than on the Pioneer: with the

Onkyo, the station memory can be a mixture of FM and DAB stations, even though a list of the stored stations with clear names in the app would be desirable. Instead you have to flick through the station memory, and we also missed a signal strength indicator.

The one-line front display allows tracks and artist names to be accessed one at a time, and in the menu or album lists, you can navigate quickly with the push/turn knob if you don't want to use the app. However, for start/stop/skip functions while streaming you have to access the infrared remote control.

Onkyo's C-755 CD player will also play

home-burnt MP3 CDs, displaying titles in clear text in the player display, even though CD text from standard audio CDs isn't displayed.

As with the Pioneer, Onkyo provides some software update features, including streaming via Cast from cast-enabled apps and the multiroom function via FireConnect, which also allows listening to music from any sources connected to the receiver throughout the entire house, even when playing from vinyl via the receiver's phono input. The Pioneer NC-50 also appears in the Onkyo app – well, it is the same app, 're-skinned' – and all devices can be given names such

KEYWORD

Network module:

The complete network electronics including WLAN and access to streaming services is usually on a separate circuitboard, often bought in as a package a specialized supplier.

R-N 855: two line and one phono input, optical and coaxial S/PDIF inputs, solid speaker terminals, gold plated contacts throughout. ▼



as „living room“, „dining room“, etc. Unfortunately, they cannot be grouped yet.

Onkyo also plans to provide complete server functionality for USB sticks or hard drives. Then, as with streaming, there will be a targeted access to albums, performers, etc. At the moment you have to navigate along the folder structure. Like the Pioneer, the Onkyo offers no direct USB connection for iOS devices, but then Airplay will offer more comfortable playback.

Extra Heavy Transformer

So, the Onkyo and Pioneer have similar features, but there are distinct differences within: the Onkyo has a much larger power transformer – as you can tell by its amazing weight – and uses the AKM AK 4490 D/A converter. Again, the power amplifiers work in Class D technology, so no fan is necessary, while Onkyo's extra-thick aluminum fronts are particularly complex.

Are the Onkyo and Pioneer synonymous in sound? Well, in terms of volume,

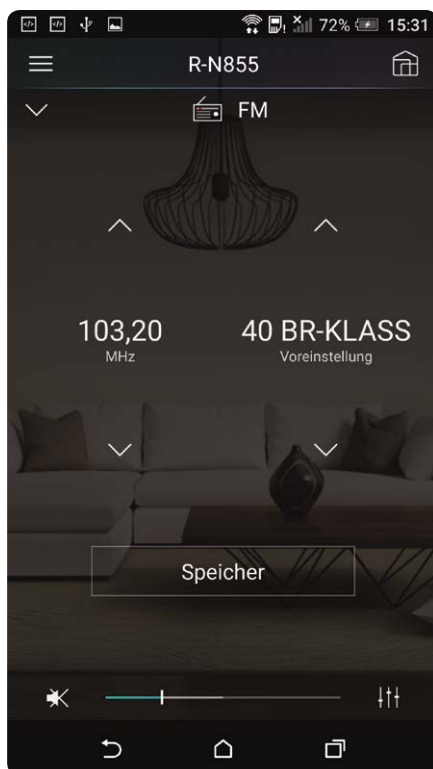
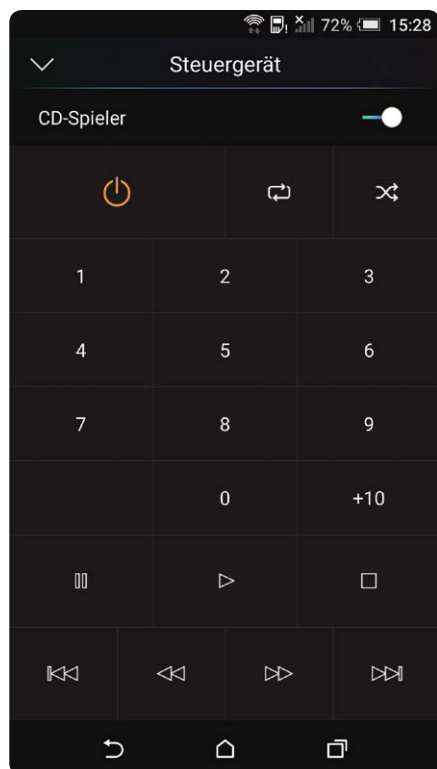


◀ The receiver remote control has a numeric keypad, and it can also control the CD player.

the Onkyo is always superior, with better dynamics, more fluidity and freshness, meaning music flows better from the speakers. That is true for CD playback as well as for streaming indicates that the strength here is in the amplifier which: for 600 euro - including tuners and streamer – it's extremely impressive.

So, what are the benefits of Onkyo's 'All in Two' solution, and what about Pioneer's 'All-In-One'? With the Onkyo, you can do without the CD player and save 400 euros, for example, making it very suitable for use as a second system in a room where you can get along without CD playback. However, if you want to use the CD function, Pioneer saves the additional cabling and the second remote control and benefits from the better integration of the CD function into the app.

Ulrich Wienforth



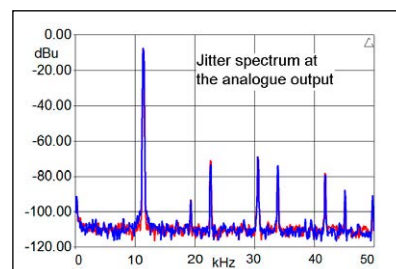
▲ The Onkyo „Controller“ app can also operate the CD player when connected to the receiver using a control cable (picture on the left). On the right you can see the tuner operation in the app - with background image.

ONKYO C-755 / R-N 855

Price: Player € 400, receiver € 600
 Warranty: 2 years
 Measurements: 27,5 x 9 x 30 cm
 (W x H x D)
 Colors: silver, black
 Contact: Onkyo
 Tel.: +49 8142/420811
 www.onkyo.de

Conclusion: high-quality finished versatile well-equipped combi with an amazingly good, powerful sound.

MEASUREMENT RESULTS



Continuous power at 8 4 ohms	52 78 watts
Pulse power at 4 ohms	97 watts
Distortion factor at 50 mW 5 watts Pmax -1 dB	0.1 0.02 0.1%
Intermodulation at 50 mW 5 watts Pmax -1 dB	0.06 0.08 0.2%
Noise ratio CD Phono MM	90 72 dB
Damping factor at 4 ohms	20
Upper limit frequency (-3 dB, 4 Ω)	> 80 kHz
Standby consumption	0.1 Watt

LAB COMMENTS: Slightly increased jitter values, otherwise very low distortions, very good noise ratios, decent output power.

FEATURES

Features: CD player, full-range amplifier, FM/DAB + tuner, streamer with DLNA, Airplay, Spotify, Tidal, Deezer, Webradio, Timer, Interfaces: C-755: analogue and S/PDIF coax-out, control jacks, RN 855: Phono MM, 2 x line in, S / PDIF optical and coaxial in, 2 x USB-A, antenna, LAN, WLAN-n with WPS, Bluetooth with AAC codec, 1 pair of speakers, headphones, line out, control sockets. Sound formats (via USB and home network): WAV/AIFF/FLAC/ALAC up to 24/192, DSD up to 11.2 MHz, MP3/AAC/WMA, scope of delivery: 2 x remote control, T-antenna, S/PDIF cable, control cable, evaluation

STEREO-TEST

SOUND QUALITY	83%
PRICE/PERFORMANCE	
★★★★☆ EXCELLENT	

MASTERFUL COMBINATION



Less than three months ago, we had the opportunity to take a look at T+A's outstanding new E-Series - we left the most exciting device for the end – the receiver.

A carpet of strings surrounds us completely, slowly growing into an ever-denser weave while the deep rumbling of basses and horns floods the entire hall from the right, and a soft crackle can be heard from some musician on the left-hand side of the stage. With our eyes closed, we are witnesses to a rousing Beethoven performance from 1976 under the baton of Carlos Kleiber, who has just navigated the Vienna Symphony Orchestra through the second movement of the 7th Symphony.

So far this is no special situation, since this excellent Deutsche Grammophon recording has long been part of our listening test repertoire. We can count ourselves lucky to get our hands on systems that make the musical experience both close and direct, as does our guest today. And yet this time even we are astonished by some fine details.

Musical Immersion

That soft crackle we mentioned wasn't a random observation, but rather a slight nuance, a whisper, which up to now we have only heard so clearly a few times – and that in itself is an indication of the resolution of the system before us.

At a price of almost 5000 euro, T+A's R 1000 E is one of the most exclusive integrated systems one can buy – it's far from being just another 'all in one'. The aluminum case is just outstandingly finished and the drawer of the CD drive has such a small gap that it could be overlooked if you don't look at the data sheets. The two massive side panels are zinc die-castings, while within the thick ring core transformer let you know what you have on hand!

On the lower rack levels in our room are the two sisters: the MP 1000 E (approx. 4700 euro) and the PA 1000 E (approx. 3200 euro) – the components on which the complete system is based. And the two-box system struggles to set itself apart from its integrated sibling.

Of course, we could take several columns to explain how amazing we find that, but as experienced test editors, we would rather lean back and explain with that all-knowing smile that we had expected it (or at least something similar). After all, in the first generation of E-Class from 2007, the integrated music receiver was the secret star, any drawbacks in the wattage performance and equipment – symmetrical connections of the full-power amplifier, for example, were missing – balanced with a playful sound absolutely exceptional for an all-in-one system.

Nevertheless, this wasn't a foregone conclusion for the new 1000 series: as T + A Development Secretary Lothar



▲ In the centre of the screen, you can see the non-encapsulated CD drive of the receiver. On the left side - the inserted CD gives us a comparison of its size - the well-proportioned transformer is visible. Despite the many ingredients, the housing is not too tight.

Wiemann explained during his visit to the editorial department, apart from the logical function of the components, nothing was taken over from the old E-Class. All three E-models are new developments, and the cards were remixed.

All Newly Developed

Just like the MP 1000 E, this receiver was constructed around a powerful D/A converter, working symmetrically and based on double-mono technology, which is essential for high-end systems. Unlike streamers with the popular EES multi-converters, where this is implemented in one chip, T + A executes each of the four DACs required discreetly, and produces them according to its own recipe. There are off-the-shelf parts, and one glance inside the unit clearly shows the signal path.

The digital heart of the system processes 32 bits and 192 kilohertz, as well as DSD 64: while this means certain compromises against the MP 1000 E, with its 32/384 and DSD 256, these really didn't bother us during the test.

The media player section, which was designed in the form of a SoC processor



▲ T+A's remote app not only controls network playback, but also can completely replace the system remote control.

WHAT IS A SOC COMPUTER?

SoC (System On A Chip) is a computer system that has been reduced to a single processor. The most popular SoC systems are smart phones and „Raspberry Pi“ with their ARM, Intel or Broadcom chips, which besides a main central processing unit (CPU) also contains plenty of memory, as well as a powerful graphics card (GPU). The latter does not play an important role in T+A. The SoC core of the R 1000 E (fig.) and the flash memory are sleekly placed on a separate circuitboard. In the unlikely event of a defect, the brain of the complete system can be easily replaced.



as in the MP 1000 E, is much more compact. Apart from the final conversion, all relevant playback processes take place here – be it the decoding, the control of plugged USB memory media or the request of new songs and playlists from a networked NAS. All the necessary software was developed in Herford as well as the nimble remote app (Android and iOS), with the Bluetooth implementation a rare exception: like other manufacturers, T + A buys in its Bluetooth modules, simply because there is no advantage in an in-house solution.

In addition to Bluetooth audio and USB signals up to 192 kHz, the receiver processes all standard sound formats. It accepts S/PDIF over five inputs, while there are also three sets of analogue line-ins. As in the PA1000 E, analogue input 3 can be upgraded with an excellent MM or MC phono option (350 euro each). Add to that the internal FM, DAB and web tuners, as well as an excellent CD player, and the

With the connectivity of its compact system, T+A goes all out: the R1000 E offers three **analogue inputs** including phono option. There are also three **analogue outputs**, two of them regulated, one with fixed level. Most of the rear panel is occupied by the **digital section** with five S/PDIF, one LAN and USB computer input. There are also antenna sockets for Bluetooth, DAB and two other USB sockets for optional WLAN antenna and/or all kinds of USB storage media. The **LAN sockets** on the far right can be used for communication with other T+A devices. ▼

T+A's input inventory runs to no fewer than 15 sources. Any more questions?

After D/A conversion, the analogue signal passes directly into the two amplifier channels, where it is boosted to a maximum of 184W into four ohms. This is another aspect in which the discreet cousin, the PA 1000 E, is nominally superior with its 223 watts, but this „little one“ can, if necessary, brutally and dynamically jump up so that there are no questions about its effective wattage. It should be pointed out that we could line it up with speaker such as DALI's Epicon 6 and Heco's Direkt (page 36 of this STEREO edition) as a combination with superb efficiency.

Sublime Character

In the end, whoever experiences the R 1000 E (or its formidable pair of siblings) in action will be ecstatic by the incredibly light-footed, relaxed and lively manner in which it breathes into the listening room jazz classics such as Take Five. The music is excellently audible, creates an incredibly wide and solid soundstage and bewitches with an extraordinarily rich color. Owners of this magical aluminum box will find the detailed „in-between feeling“ quite normal, since it is part of the basic repertoire of the receiver.

Yes, go for the two box 'big chain' and you get more watts and equipment, but never before have we had in our hands a compact system where this „slightly less“ felt so incredibly much!

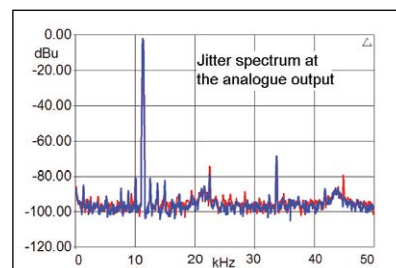
Carsten Barnbeck

T+A R 1000 E

Price: around € 4990
Warranty: 2 years (3 after registration)
Measurements: 44 x 12 x 37 cm (WxHxD)
Colors: silver, black
Contact: T+A
Tel.: +49 5221/76760
www.ta-hifi.de

Conclusion: T+A comes closer to the goal in the hunt for the perfect integrated system. R 1000 E, apart from refinements, is an optimal alternative to a discrete E-Class system.

MEASUREMENT RESULTS



Continuous power at 8 4 Ω	106 158 watts
Pulse power at 4 Ω	184 watts
Distortion factor at 50 mW 5 watts Pmax -1 dB	0.03 0.005 0.03%
Intermodulation at 50 mW 5 watts Pmax -1 dB	0.02 0.006 0.2%
Noise ratio CD Phono MM	87.8 - dB
Damping factor at 4 Ω	66
Upper limit frequency (-3 dB, 4 Ω)	41 kHz
Standby consumption	- watts

LAB COMMENTS: consistently very good readings. Due to its enormous presence, the R 1000 E also sounds stronger than it actually is. The D/A converter section, which is not listed here, also works very well.

FEATURES

Features: CD player, full-range amplifier, FM/ DAB + tuner, streamer with UPnP, DLNA and web radio; interfaces: 3 line inputs, S/ PDIF (2 x optic, 3 x coax), 3 x USB (computer, storage media), antenna, LAN, WLAN via USB dongle), Bluetooth, 1 x Digi-Out (coax), 2 x Pre-Out, 1 x Rec-Out, 1 pair of speakers, headphones (6.3 mm), sound formats: all up to 24/192, DSD 64, scope of supply: remote control, WLAN dongle, power cord

STEREO-TEST

SOUND QUALITY	100%
PRICE/PERFORMANCE	
★ ★ ★ ★ ☆	
EXCELLENT	



SERVER WITH STYLE

Musical Fidelity's extremely powerful M6 Encore 225 is aiming for a rare combination: a full-range amplifier with an integrated ripping server



If you're a company best-known for its long-held analogue values, how do you position yourself in the new computer-based audio landscape? For Antony Michaelson – founder, owner and technical mastermind of Musical Fidelity – the question was already half-answered: after all, his company had previously won an EISA award with its compact M1 CliC: one of the first network player, D/A converter and preamp combinations.

It offered a choice of digital or analogue outputs, and above all retained the lively, agile sound of the brand, always refined-sounding but with plenty of dynamic ability. And yet Michaelson himself saw this successful entry into the market with mixed feelings, since the CliC was based around the Stream Unlimited platform – good solution, but ultimately an off-the-shelf one. Michaelson wanted more flexibility, more opportunity to influence both the user-interface and the operation of the product.

In short, he wanted his own computer audio solution, so for the new products from the Wembley brand, it was the old reliable computer way: press the reset button for more than three seconds and start again from scratch after the reboot...

Everything at the beginning

Except it took rather more than three seconds, and there really weren't 'factory settings' to go back to – Musical Fidelity was starting from cold, with little appreciable

experience in computer design, which is why it took a whole five years before the British manufacturer could launch another digital machine after the CliC. That may seem a very long time, especially when set against the relentless churn of the audio industry, but then the new creation, despite its initial outward impression of extreme simplicity, is said to be an exceptionally advanced device.

With this knowledge in mind, the M6 Encore 225 all-in-one system doesn't try to be modest: it's not just a single model, but also the start of something very big for the company. As Michaelson told us on his visit to Euskirchen, more is soon to come: quite apart from the "M6 Encore Connect" (around 4300 euro), which is essentially the "225" minus the power amplification, you can read a lot into the fact there is an M6 prefix on the model numbers here. Don't be at all surprised to see Encore models joining the other ranges in the Musical Fidelity catalogue.

But let's take a closer look at the powerful M6 Encore 225: the first thing you notice – you could hardly miss it! – is its amazing 23kg weight, mainly due to the solid full-metal casework with its purposeful cooling fins, and the large, heavy toroidal transformer inside.

KEYWORD

Web server:

Devices with a „virtual“ web server can display the control interface, as well as accessing more detailed function, via any compatible Web browser.

The backbone of the massive system, however, is its analogue Class AB integrated amplifier section which switches its three inputs as well as two outputs – fixed and variable level – with high-quality relays, allowing Musical Fidelity to keep an analogue feeling even in this most digital of products. The output into eight ohms is 175 watts, but that "225" designation isn't a misnomer: into today's speakers, commonly with 40hm impedance, it delivers a more than healthy 259 watts of continuous current, with instantaneous peaks of up to 320 watts. In short, despite its compact design, the M6 is heavy-hitter.

But that amplifier is, of course, only half the story: the rest is the integrated media server. Musical Fidelity originally released the Encore with 1TB of storage, server, but with easy replacement allowing the user to upgrade the hard drive; t German distributor makes use of this and supplies the device with a 2TB drive at no extra charge with a 2-TB drive, corresponding to about 5000 albums.

Linux Inside

There are two basic ways to fill the server with files, the easiest being via the central slot-in drive: insert a CD and it's ripped loss-free to the hard disk using a Linux-based, highly modified version of the tried and tested "Exact Audio Copy". It clearly does a fine job when it comes to bit-accurate ripping: we could detect no difference between the Encore's rips and the data of our reference rips (created by dbPower-amp), 35 albums' worth of which we also copied to the device.

Meta-tag data gave no cause for complaint for us, though as usual if you want to have 100% title information, you have



◀ A picture paints a thousand words: here you see the entire input/output section of the M6 Encore 225, with the conspicuous screw at the bottom left accessing the hard disk bay – a 2TB drive is supplied as standard in Germany. The speaker connections are not shown.

get a little hands-on! The drive can also play CDs rather than ripping them, though copying to the hard disk is the default function – to turn it into a player you have to activate that function in the Encore 225's menu.

The second way to store music onto the hard drive is via a computer on the same network. The Encore supports a web server, mirroring of its complete user interface (and more), which can be reached by typing "http://encore.local/" in the address bar of the computer's browser – this also enables you to access the device's on-board instruction manual.

The "Library" tab provides an overview of all stored tracks and albums. If you have music on the PC or a connected NAS, which you want to transfer into the Encore, you simply drag and drop them somewhere into the Library field, beginning the copying process. There's a progress bar at the bottom of the screen. This 'drag and drop' interface currently only works with Google's "Chrome" browser, although the manufacturer is working on extending compatibility, and you can operate the rest of the control, play commands, title info, etc., via tablet or notebook from any other browser. There's also a free remote app available for Android and iOS – and of course one can also use the Encore 225 pretty well using high-resolution display, and the remote handset supplied.

This is one of the most intuitive audio servers we've encountered, with the transmission of an existing music collection via 'drag and drop' especially smooth. On request, the server can also "clean up" the

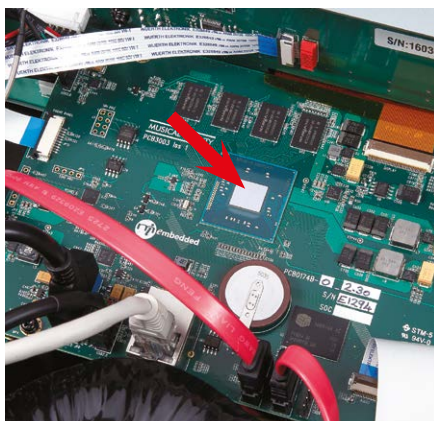
music tracks and re-tag it via its integrated database connection. All digital signals are converted by a 384kHz/32bit DAC, although the two inputs for external digital inputs are, of course, limited to 192kHz/24bit. As well as playing from the internal hard disk, the Encore 225 can also play music stored on USB sticks or HDDs plugged into one of the three USB connections, while another easily accessible socket on the front provides portables and smartphones with standard power supply.

There's also a USB-B connector on the rear panel, which is due to be activated shortly via an update, the manufacturer pointing out that the device, while perfectly usable as it stands, is very much a "Work in Progress", with further features to be added via firmware. These will arrive, as if by stealth, in the dead of the night, the M6 waking from its slumber at 3am daily to see whether anything is available. We find this pleasantly unobtrusive.

With clenched fist

As already mentioned, the British manufacturer has a reputation for a full, refined sound, and the Encore 225, with its considerable power reserves, is no different. In our listening room the heavyweight convinced us right away with grip, directness and entirely imperturbable dynamics. Add to that a silky character, which gives voices and instruments a wonderful brilliance, and even at very high levels nothing jars or annoys. With the M6 one can really let rip with the music, thus forming a wonderful contrast to the rousing, but always disciplined, T+A R 1000 E.

Carsten Barnbeck



▲ The computer motherboard proudly carries the Musical Fidelity label: While the fast dual-core processor (arrow) and all other chips are purchased from third-party suppliers, the concept and software of the electronic brain all originate in-house.



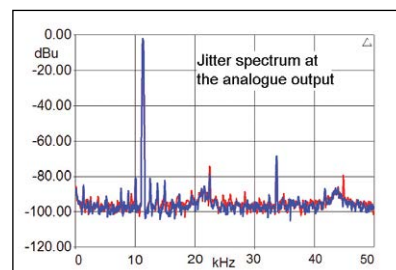
▲ Digital system with analogue charm: the connection section of the M6 switches and operates via a phalanx of relays.

MUSICAL FIDELITY M6 ENCORE 225

Price: at 5300 €
Warranty: 2 years (3 after registration)
Dimensions: 44 x 12 x 37 cm (WxHxD)
Colors: Silver, Black
Contact: Reichmann Audiosysteme
Tel.: +49 7728/1064
www.reichmann-audiosysteme.de

Conclusion: This excellent first server from the British company is a thoughtful, intuitive design – and the sound is all about power and musicality!

MEASUREMENT RESULTS



Continuous power at 8 4 Ω	173 259 watts
Pulse power at 4 Ω	320 watts
Distortion factor at 50 mW 5 Watts Pmax -1 dB	0.01 0.003 0.006%
Intermodulation at 50 mW 5 Watts Pmax -1 dB	0.002 0.001 0.1%
Noise ratio CD Phono MM	84.2 - dB
Damping factor at 4 Ω	20
Upper limit frequency (-3 dB, 4 Ω)	> 80 kHz
Standby consumption	- Watts

LAB COMMENTS: Good values! And while there's no standby switch, the M6 has a sleep mode: its LAN input remains active, and the device consumes about 5 watts.

FEATURES

Features: CD-Ripping drive (also usable as a CD player), 2-TB hard drive, full-range amplifier, 24/192-D/A converter and web radio Interfaces: 3 line inputs, 4 x S/PDIF (2 x optical, 2 x coaxial), 4 x USB for memory media, LAN, 2 x Digi-Out (optical / coaxial), 1 x Pre-Out, 1 pair of speakers, headphones (6.3 mm)
Sound formats: all up to 32/384
Accessories supplied: Remote control, engl. Short manual, power cord, LAN cable, handling gloves, display care set

STEREO-TEST

SOUND QUALITY	89%
PRICE/PERFORMANCE	
★ ★ ★ ★ ☆	EXCELLENT

STATEMENT OF ACHIEVEMENT – AND INTENT

IN THE HIGH-END WORLD FULL OF
SUPERLATIVES, NAIM HAS ESTABLISHED A SPECIAL
POSITION WITH THE STATEMENT SERIES

naim

Build something sufficiently striking and intriguing, and people will come to admire it. That's the case of the ancient stones of Stonehenge, set on a plain in Wiltshire, England: its true purpose may be lost in the mists of time, but it still attracts millions of visitors a year, and still causes traffic jams and accidents as passing motorists feel compelled to stare distractedly at the ancient monument.

And it's certainly the case with the Statement amplifier, built just a few minutes away in Salisbury by Naim Audio. OK, not so many road accidents, but the Statement has been an object of fascination for hi-fi enthusiasts since it was introduced some three years ago, too the extent that its rare public appearances, at shows or dealer events, still draw the crowds.

It's not hard to see why: just as the Statement - a preamplifier and a pair of monobloc power amps, all three in rather Stonehenge-like vertical columns - is the culmination of more than four decades of Naim amp design, so it's also leading the way forward for the company's future products, with technology developed for this flagship system already finding its way down to everything from its mainstream pre/power amps to the Muso systems and the new Uniti range.

After all, company founder Julian Vereker showed new ways to build an

amplifier with his very first product, the NAP 200 amplifier, which has since been modernized and refined again and again under the same name ever since. By profession a mechanical engineer rather than an electronic one, with a background in modifying and racing Minis, the music-loving Vereker is regarded as a pioneer in the field of both the mechanical and electronic aspects of hi-fi components. As evidence, early 500,000 products have left the plant near Salisbury in the past 40 years - and most of them are still in use - not least because Naim's service department can still repair, restore and refresh even the earliest models.

Over the years, Vereker's small company has become a globally-respected manufacturer with over 160 highly-qualified employees still producing most of the products by hand in the Salisbury factory. Paul Stephenson, who took over the management of the company after Vereker's death and now passed on the baton to Trevor Wilson, always considered it of the utmost importance to preserve the values Vereker imbued in the company: family, team spirit and communication.

As an example, the famous Naim canteen is one of the 'hubs' of the company: staff can help themselves to food and drink for free, but even more to the point can meet informally in small groups to talk about the current tasks

in the company. The seating capacity is limited to about 50 seats, meaning that lunch is taken in shifts, this leading to small work-groups tending to east, and discuss, together.

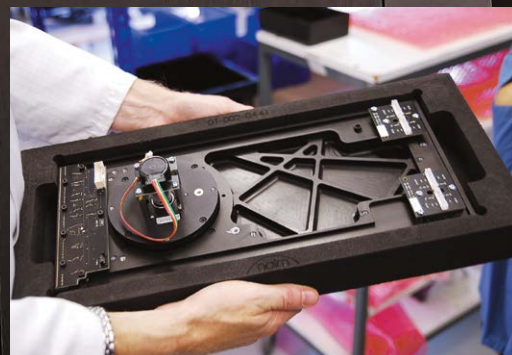
Sustainability is all

Naim products are considered to be practically indestructible and extremely durable - nevertheless, a defect can occur, but the British are also regarded as exemplary in the services area. Not only in reference repairs, but also in value maintenance by inspection and replacement of older components. Whether capacitors and other components age and should be replaced is a constantly-debated topic, but Naim has a clear opinion: after about ten years the equipment should be serviced - and then fully enjoyed. And upgrades are possible for many devices - as had been made clear with the 'retrofitting' program for the company's DR technology.

Discrete Regulation for power supplies, bringing a lowered noise floor and superior current delivery, was developed as part of the engineering



▲ Julian Vereker, who died in 1999, founded the company in the mid-seventies with his buddy Paul Stephenson.



▲ Every detail of the Statement project must be meticulously planned - from material through build to logistics.



▲ Mastermind Steve Sells broods, researches and develops and is given free rein for Statement.



▲ Today Trevor Wilson is the director of the company.



◀ A transformer for weightlifters and power fetishists, secured with four solid screws - power: about four KVA.

◀ From any angle, Statement amplifiers have the look of a sculpture.

process behind the Statement Series, but since the range-topping products were launched has spread through the Naim range, taking in power amplifiers and power supplies, and all the way down to the Supernait 2 integrated amplifiers. Owners of older power supplies can have their products upgraded to DR specification, while the DR process for power amps also brings in the improved power transistors also developed for Statement.

Of course, durability was also included in the specification of the preamplifier/amplifier combination, to which we devoted our attention during a visit to Wiltshire, but more fundamental is the way the company's research is carried out to build amplifiers without any regard for cost, and then informs more affordable models.

Development from scratch

Considering the claims for Statement and a total price of around 200.000 euro, it was clear that the amplifiers should be designed to drive all relevant loudspeaker models without any restrictions. That meant a lot of power and, in turn, appropriately-designed power supplies. And Naim really understands power supplies: some manufacturers have in recent years offered separate power supplies for the perfection of their top-of-the-range models, but at Naim this has been part of the

expertise for decades. However, even that was not enough for Audio Electronic Design Director Steve Sells and his team; they sought – and found potential for – an even better power supply for what were intended to be “the best electronics on the world market”.

Matters of Architecture

But before that, it was necessary to tread unknown paths, as is always the case if one wants to create something really new. The immediately visible result of ten years of brainstorming and three years of intensive development work is a structure that could probably win prizes as an unusual example of high-rise architecture. Just under a meter tall, the „Statement“ stands out immediately with its wave-shaped, side-mounted cooling elements, but this tower style was by no means the inspiration of fame-hungry industrial designers. Rather it was function over form: the break with Naim tradition followed the recognition that only in this form could be fulfilled all the electrical, magnetic, thermal and ultimately sound requirements such a development entails.

The essence of a good amplifier is in its power supply, and the realization of this is found in the lower half of the two NAP S1 mono amps, in the form of a truly huge 4000VA, 25kg transformer, mounted vertically to avoid vibration and fixed in place in hefty brass supports with four massive bolts. Yes, it delivers a lot of power – after all, the amplifier is rated at 746W into 8ohms, and is said to be capable of a 9kW burst into a 1ohm load – but for the development team more important than the pure output was the silent functioning of this giant among the transformers, both

mechanically and electrically. That also informed the vertical orientation, which ensures any stray magnetic fields are dissipated harmlessly to the sides, rather than up into the amplifier section above.

Quietness was always another important word in the implementation of these amplifiers. In addition to the actual signal input, consideration was given to interference from the power supply due to vibrations, thermal fluctuations, magnetic fields, mobile phones and switching power supplies nearby and ultimately the connection from the power supply into the amplifier circuit.

Power supply at the limit

Naim's discrete regulators, developed over two long years of listening tests, are used in no less than 38 places in the NAP S1 preamplifier, with another four per power amp. Their job is simple: to ensure that the DC voltage at their output remains constant under all circumstances, without producing additional interference, and at the same time to maintain the output impedance at zero as far as possible, while also responding to sudden power demands without delay. Existing solutions didn't convince the critical Naim ears, so a separate circuit design was created and put into production.

Transistors à la carte

In the hi-fi world, it's rare for a manufacturer to be able to produce a transistor exclusively to its specifications - the quantities are normally too small and the costs too high to preclude anything other than 'off the shelf' solutions. However, the „Statement“ project was always 'cost no object', so there was a considerable budget to avoid any bottlenecks at this point.

Hence the NA009 transistor, custom-made to an exacting Naim specification, and again developed over lengthy listening sessions involving many

iterations. To lower resonances inside the semiconductor and thus lower the noise floor, the housings and connections of the transistors are made of non-magnetic materials, and mounted on an insulating and heat-dissipating ceramic block to reduce the capacitance by a factor of nine compared to the previously used types.

For consistency, not only are all pairs of transistors used here derived from the same silicon wafer, but from the same part of that wafer, then numbered and pair-matched. Again, time-consuming - and expensive!

Once you get Steve Sells started on the design of Statement, get comfortable - you're in for the long haul. No stone is left unturned, whether he's discussing something as small as the precise use of the 'legs' of wire connecting a resistor to a circuitboard or the Statement preamplifier's new volume control, activated only on volume adjustment and then immediately disappearing again completely from the signal path.

And then we get to the multilayer circuitboards, which are suspended on matching spring/mass systems or the symmetrical circuit design, and it becomes

clear the extent of the endless list of small and large measures involved in this project on its way to serial production.

And listening - lots of listening - solved the question of feedback, with the result that there's minimal local and no negative feedback loop correction. The pre-amplifier runs in Class A mode; the output stages, whose switching-on procedure is time-delayed by a diode, in AB.

The high-rise construction made it possible to perfect the placement of the various sections of the amplifier, for the shortest possible cable routes, to optimize resonance and control the thermal system. Even that acrylic 'fillet' across the amplifiers serves more than a design purpose: it also provides an interference barrier between power supply and amplifier electronics - a further contribution to noise levels right down at the limits of measurement.

Making the Statement

Design is one thing, making the design another: the team could brainstorm about how such a product could be built - a logistical challenge of a special kind, not least due to the bulk and mass of both components and finished units. Even within the qualified Naim team, it was necessary to search for the best, and then develop special training courses to ensure perfection right down to the last detail.

A single Statement system per week is assembled by two people and then completely subjected to a functional and stress test by a third person. If the time required by the suppliers is counted, it takes about three weeks before an NAC S1 and a pair of NAP S1 is ready to go, a process which has happened more than 60 times in the two years since the start of production.

The proof is in the listening

Expectations were high, given a price tag in the six-digit range for the amplifiers alone, when we entered Naim's mildly-optimized listening room after intensive technical explanations. The sources were Naim's 555 CD player and the NDS network player, while the speakers were Focal's Utopia Stella, which Naim has been using since 2011 - English and French hand in hand, with the two companies sharing ownership, albeit at different locations.

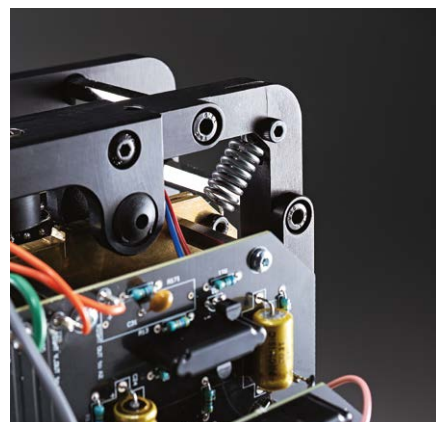
The sound lingered on for days. It had little to do with that we've known from decades of experience - music just poured into the room, taking a grip completely within seconds, regardless of the style. There was an optimal response at whisper levels or concert volume, and we were so involved that the search for the fly in the ointment was solved by itself: there isn't one!

Naim's Statement delivers a truly addictive experience - and one you can have at selected retailers.

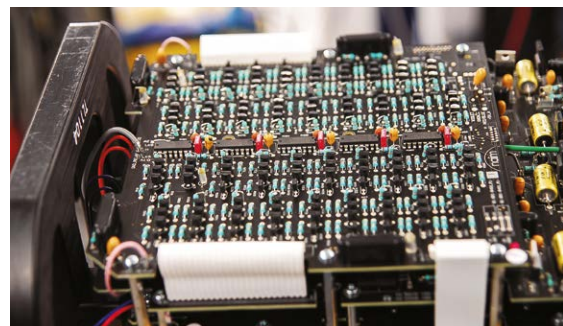
Michael Lang



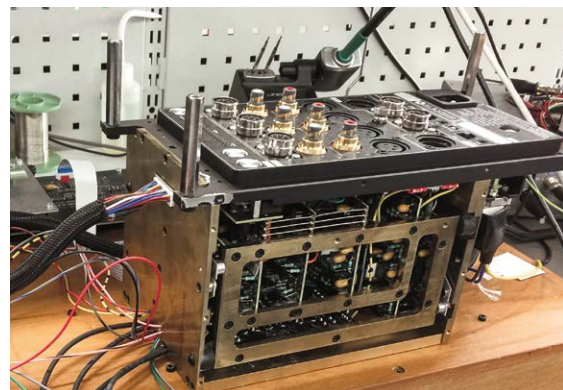
▲ Cable and ventilation slots, a multi-storey structure, strictly selected components - the price of Statement is not a coincidence.



▲ Sometimes hard, sometimes compliant: the aluminum, copper and spring system are coordinated.



▲ Who counts the components? The effort can hardly be grasped, in this case the preamplifier section.



▲ Each individual assembly is rigorously tested.



Made in England

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THE LEGEND, REMASTERED

AVAILABLE APRIL 2017



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Native
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Automatic
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Future expansion
module support



Remote control
functionality



All-new case design
by John Franks



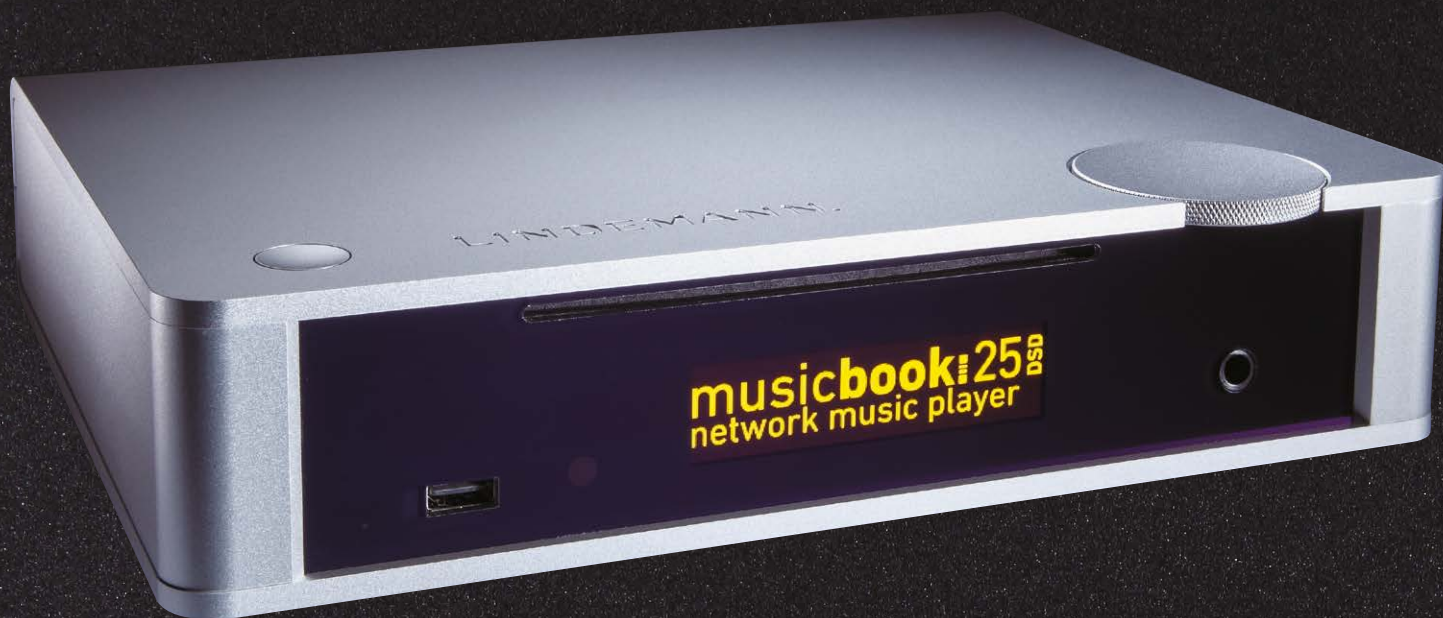
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LINDEMANN.

Format madness is taking hold! At least that's the impression that one gets in the sales areas of a specialist dealer, where there are devices showing bitrates of 352kHz and more, and which are even capable of processing DSD 512 signals – even though it's hard enough to find music in the comparatively low-resolution of DSD 64.

Why? Well, digital devices have always faced a problem: addition to the actual audio data, digital converters generate their own noise, which needs to be

removed as part of the playback process. At its simplest, this problem is tackled with analogue filters in the output stage, but the more they intervene, the more they influence the timing and phase of the music.

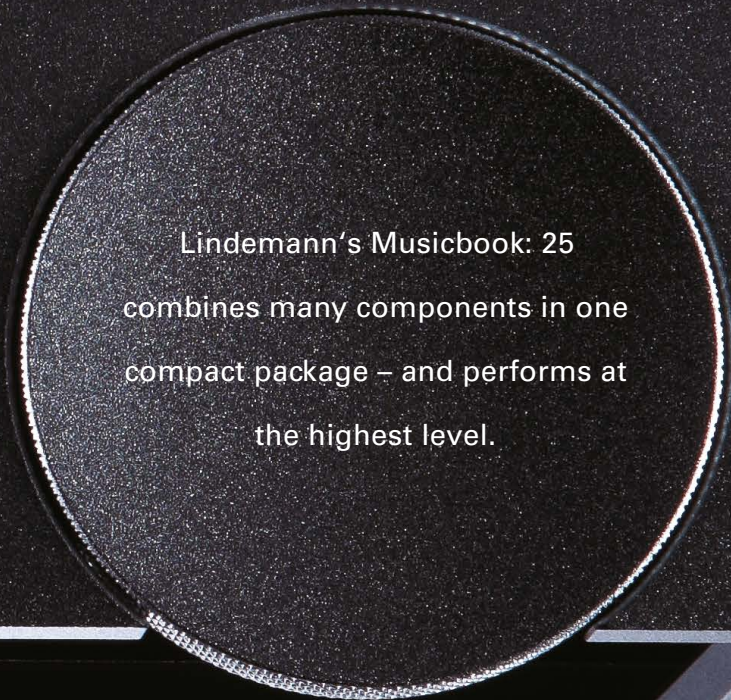
DSD as a data-polisher

However, there is another way: these days, just about every DAC is capable of handling very high bitrates, so to push the noise well out of the audible band, it's possible to exploit this capability by

upsampling incoming datastreams to 96kHz, 192kHz, or even above, so that any spurious noise generated is well beyond human hearing, and thus more easily removed.

A growing number of manufacturers – including Lindemann, the maker of the Musicbook:25 DAC/network player we have here – are even starting to say goodbye to the traditional PCM in favor of internal working based on the DSD format. This has great advantages: the clock here in the megahertz area, standard DSD

MUSICBOOK MASTERCLASS



Lindemann's Musicbook: 25
combines many components in one
compact package – and performs at
the highest level.

(or DSD64) being a 2.8 MHz/1-bit format, DSD128 pushing that up to 11.2MHz and DSD256, or 'quad DSD', all the way up above 20MHz. Our hearing is guaranteed to not pick up artifacts in those frequency bands!

Norbert Lindemann was enthusiastic on his visit to our editorial department, explaining that „Direct Stream Digital“ is an 'analog digital' format. The zeros and ones of the data stream are not here for individual samples, but form the edges of an analogue waveform: a „one“ increases

the amplitude, another one climbs the edge even faster and even higher. If a „zero“ follows, the amplitude decreases again. Believe it or not, you could send the DSD data stream directly into the pre-amp via a capacitor (used as a low-pass filter to take out all the ultrasonic content), and it would produce a usable music signal there.

This small technology crash course makes it easy for you to understand what makes Lindemann's Musicbook 25 so special. Although the concept of DSD

upsampling is a complex process, the effect is astonishingly simple, since digital processes and analogue output stages work together here instead of masking the mistakes of the other.

Data received via one of the four S/PDIF inputs, USB, LAN, WLAN or Bluetooth are all upsampled to DSD 128 or DSD256, using two digital clocks – one for CD's 44.1kHz and its multiples, the other for 48kHz, 96kHz and so on – to avoid resampling and the resultant rounding errors. Two aliasing filters settings can



◀ Musicbook combines an amazing variety of gold-plated connectors on its rear panel

be selected, this purely mathematical filter stage being built directly into the Asahi Kasei AK4137 upsampler used here, and the digital to analog conversion itself is handled by two AK 4490 devices from the same company, sued in dual-differential mode for even greater noise-cancellation.

Meanwhile, signals entering the Musicbook:25 via the two analog inputs are passed directly and unchanged into the analogue preamplifier.

The Munich-based company has been producing the Musicbook series since 2014 and has now introduced the new DSD generation. The „source side“ consists of four models: the Musicbook:10 (around 3280 euro) is a preamp with D/A converter, while the otherwise identical 15 (around 3780 euro) adds a CD drive. The two pricier models – the 20 (around 4280 euro) and our test model, the Musicbook:25 – also have comprehensive

network players, again the difference between the two being the CD drive in this range-topper. The four siblings are complemented by two y matching power amps, which we present in the box on the right.

Great User Guide

The Teac drive in the 25 is a slot-loader, and so well integrated as to be all but invisible at first glance, sharing the front panel of the unit with a headphone jack, a USB input and the excellent fine-text display, which provides information about the conversion processes. The top line clearly indicates the sampling rate of the incoming signal and what the D/A converter is doing, so it's impossible to confuse the transparent and incredibly liquid sound of a native DSD input with the crisper and lighter upsampled **PCM**.

The excellent User Guide explains all essential functions of the versatile little

FORMATS & SERVICES

Supported audio formats: DSD256, WAV, AIFF, FLAC (all up to 24/384), ALAC (max 24/96), MP3, AAC, Ogg Vorbis, WMA

Web streaming services: Tidal, podcast and internet radio

Network/Media Player: detects UPnP and DLAN data sources in the local network, WLAN, Apt X-Bluetooth, playback of USB storage media, Gapless Play with WAV, AIFF, FLAC, ALAC and MP3

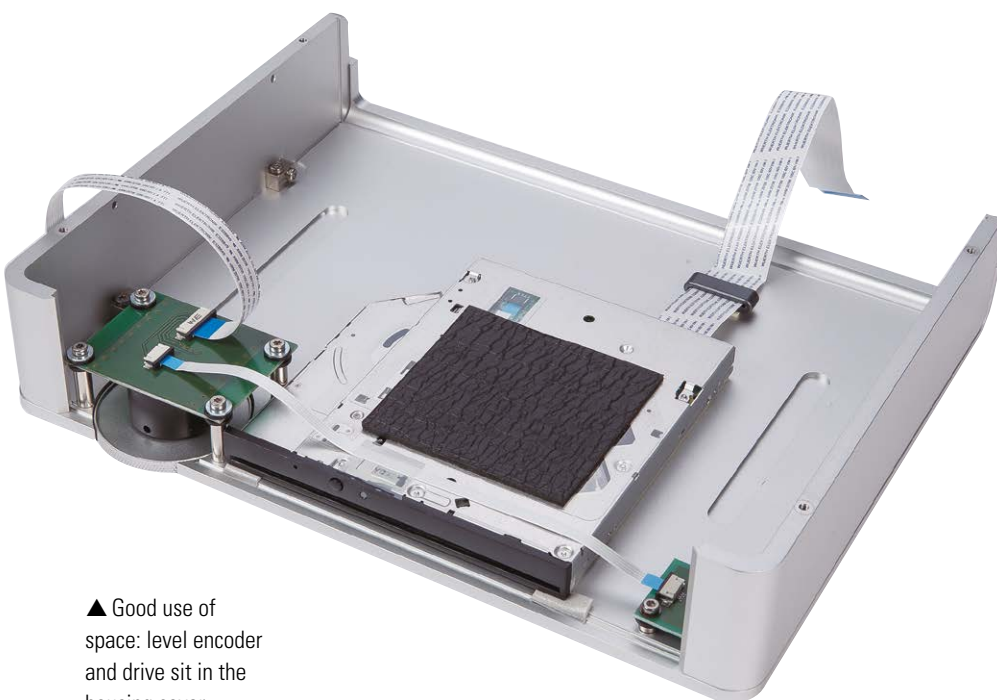
Control: system remote control, free app (Android and iOS)

machine in large figures and diagrams and shows numerous application and connection examples, which illustrate how to connect the preamp with active speakers, power amplifiers and so on, over 32 wide-format high-gloss pages. This effort deserves praise, and other manufacturers would do well to imitate it – if they want to see how it's done, a PDF version of the manual is freely accessible on the manufacturer's website.

In addition to the drive and DAC, Musicbook:25's main source is the integrated extensive network player, built on Audirvana's streaming platform: as well as DSD it supports PCM formats up to 24/192 and - except for AAC and WMA - allows uninterrupted gapless playback.

All these functions are controlled by Lindemann's in-house-developed Android and iOS app, which provides a very good overview and smooth operation. The control software even offers sorting and filtering options for the integrated Tidal service, which were new to us: or example, recently added favorites can be displayed. A further contribution to the general transparency of the complex digital technique can be found by

▲ Good use of space: level encoder and drive sit in the housing cover.





◀ No more changing batteries: the rugged remote handset can be charged via its USB port or via any mobile phone power supply, and accesses system settings unavailable via the Lindemann control app.

tapping on the cover picture of the current song during playback: this reveals a small table with the actual „de facto“ rate of incoming signals. In this manner, we discovered that Tidal's premium subscription sometimes smuggles in low-resolution data...

After conversion, the signals pass through a completely symmetrical and discretely constructed dual mono preamp, with a purely analogue level control controlled by an encoder wheel which, mounted on the case lid, protrudes a little to the front and conveys a feeling of high-quality workmanship, rather like a thumbwheel control on a fine camera. However, we were surprised by its operation: to increase the volume you have to turn it to the left, which seems almost willfully counter-intuitive.

The Musicbook:25 stands out with its almost invincible neutrality, which is especially apparent with minimalistic arrangements – such as on Christian

Willisohn's outstanding album „Hold On“ –, allowing as it does a fine view of individual instruments. The Musicbook projected the blues pianist plastically and with surprisingly natural proportions in the listening room, opening up every detail of the outstanding recorded environment, as well as all the nuances of the piano. Yes, the superb tonality can be limited –the DSD upsampler sounds somewhat softer, more transparent and velvety in the higher ranges when compared with the slightly brighter PCM mode – but both have almost incredible dynamics and timing, giving the 'Number 25' a very exciting musical flow, and both excitement and neutrality.

Teamed up with the matching Musicbook:55 power amplifier, we consider Lindemann's Musicbook:25 to be a high-end system, which would be hard to beat for musicality, operation and design. Top marks in all sectors!

Carsten Barnbeck

KEYWORD

PCM: Pulse Code Modulation - the oldest technique for digital imaging of audio signals.

TWO SUITABLE POWER STATIONS

Lindemann completes the Musicbook series with two power amplifiers, in matching housings. The less expensive 50 (around 1980 euro) uses Class D amplification to provide 2 x 80 watts, but we tested the 25 with the more ambitious „55“ (around 2980 euros): with 2 x 240 watts it could unleash a real dynamic storm in our listening rooms. The combination harmonizes perfectly, and not only visually: the power amplifier plays to the characteristic strengths of the pre-amp, and adds no character of its

own. Its sheer power give it incredible control down to the lowest bass register, underscoring the impressive dynamics and the outstanding musicality of the „25“. A perfect team!

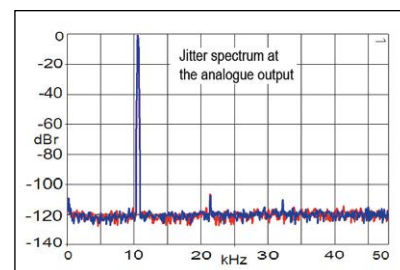


LINDEMANN MUSICBOOK 25 DSD

Approx. 4780€
Measurements: 28 x 7 x 22 cm (WxHxD)
Warranty: 5 years
Contact: Lindemann Audiotechnik
Tel.: +49 8153/9533390
www.lindemann-audio.com

Lindemann's Musicbook is an excellent symbiosis of top quality, flexibility, superb ergonomics and excellent processing – it's a 'designer' system to makes even the most discerning music-lover happy.

MEASUREMENT RESULTS



Distortion Factor (300 mV)	0.001%
Noise level CD (500 mV, 1 kOhm)	102.8 dB
Stereo channel separation (10 kHz)	88.6 dB
Noise ratio Digital	0 97.7 dB
Distortion Factor (400 Hz / -9 dB)	0.002
Transducer nonlinearity up to -90 dB	0.1 dB
Output resistor cinch	40 W
Power consumption	
Off Standby Idle 0 <2 11 watts	

LABORATORY COMMENT: consistently good to very good measured values in analogue and digital part. In addition, the low power requirement in idle mode and operating is very pleasing.



EQUIPMENT

Slot-in CD drive, 4 digital inputs (each 2 x coax and optic), 2 cinch analogue inputs, 2 x USB (computer, data carrier), LAN/WLAN, UPnP / DLNA network player, web radio, Bluetooth, Tidal, system remote control, remote app (Android / iOS)

STEREO - TEST

SOUND LEVEL NETWORK	92%
SOUND LEVEL DAC	93%

PRICE/PERFORMANCE



OUTSTANDING

MUSICAL FIDELITY

NU-VISTA CD PLAYER



State of the art design for reference level reproduction

The Nu-Vista series is a passionate labour of love for all of us at Musical Fidelity.
We hope that at least you get a chance to hear this combo because we
consider it the ultimate expression of our art.

Experience it for yourself at your local Musical Fidelity dealer.



ROOM FOR MANEUVER?

How do you match your speakers to your room? Are there rules?

And can they be broken? *By Andreas Kunz and Carsten Barnbeck*

In the past, we've advised on choosing speakers to suit your listening preferences; now we're giving our full attention to a decisive aspect – how does the room acoustic affect the sound of loudspeakers? Do high-quality sound just as good in every room and, if not, what rules

should be observed. Are small speakers more suitable for tiny rooms, and massive floorstanding models only good in huge spaces? And is there room for maneuver when it comes to pushing – or even breaking – these rules? To find out, we carried out a practical test, using three

high-quality loudspeakers of different dimensions – Canton's Vento 830.2, DALI's Rubicon 5 and the T+A TCD 110 S (see description on the right) – in rooms of 50, 25 and 14 square meters respectively. Then to the listening impressions with music of different styles we added by measurements that show us the frequency response of the loudspeakers under real conditions. The results? Get ready for some surprises!



BASIC BUILDING BLOCKS OF ROOM ACOUSTICS

Space is without a doubt an important component for good sound. The effect of space is essentially determined by three physical dependencies:

- 1. The room dimensions:** sound consists of air pressure fluctuations, and due to the fixed wavelengths of the various frequency components, these pressure fluctuations are directly related to the dimensions of the listening area.
- 2. Absorption, Reflection, and Diffusion:** Furniture, carpets and curtains influence our sound perception, as do reflective window surfaces or naked walls. The stability of masonry, ceilings and floors also plays a role. If these surfaces can vibrate easily, there's a danger of them drawing too much sound energy out of the room.
- 3. Relation of equipment and space:** It is also important how much energy the loudspeakers can release, which is also contingent on the amplification driving them, and how many cubic meters have to be stimulated overall. This is exactly what we are investigating in this report.

THE SPACE INVADERS

For our space excursions we needed loudspeakers of different sizes. These are our candidates:

CANTON VENTO 830.2

Price per pair: € 1300

The 830.2 is the largest of the three compact Ventos, with numerous technical connections to the company's Reference series. With an impressive 86.5dB/W/m sensitivity, it's a good match for any integrated amplifier.



DALI RUBICON 5

Price per pair: € 2850

Thanks to its elaborate double-tweeter, this speaker is transparent, detailed, yet still velvety and fluid. DALI's smallest Rubicon floorstander is a loudspeaker to fall in love with, and was able to prove its class in all three environments. It's also extremely easy to set up.



T+A TCD 110 S

Price per pair: € 7900

T+A large-calibre TCD 110 S is the entry-point into the top league - and a comparatively affordable one, too. Thanks to its linear tuning and dynamics, the huge Criterion moves seamlessly from controlled elegance to pure-blooded and fun-loving - you just have to turn the volume control a little. And thanks to its transmission line design, the bass really plumbs the depths.





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LARGE ROOM 52m²



A HALL FOR CONCERTS

An open room, arched over with wood-paneled sloping ceilings: it's a nice place to live, but is it also well-suited to good music?

This room is flooded with light, a cozy leather sofa invites you to linger, as does the smell of fragrant candles. If it sounds only half as good as it looks, then...

Full of anticipation, we get to work and connect the Symphonic Line RG9 MKIV Reference HD, a top-class full-range amplifier, with the T+A TCD 110S, the Herford company's flagship that's out-classed so many competitors in the STEREO listening area, not least because of

its dynamic capabilities. Because of the considerable volume of this room – 52 square meters, and with a ceiling height of up to 6.48 meters – there are many reasons to believe that the largest of our three speakers will be the most convincing.

Full force

We start off our listening session with the evergreen „Take Five“ (Dave Brubeck Quartet), and the sound is impressive across the frequency range, but especially



▲ The living area of the largest room is framed by a gallery

in the deep tones: Gene Wright's double bass and especially Joe Morello's bass drum are almost physically perceptible, without being intrusive. Paul Desmond's alto saxophone sounds crystal-clear, as does Morello's hi-hat, and if there's anything to complain about, it's just a slight sharpness in treble. But things change

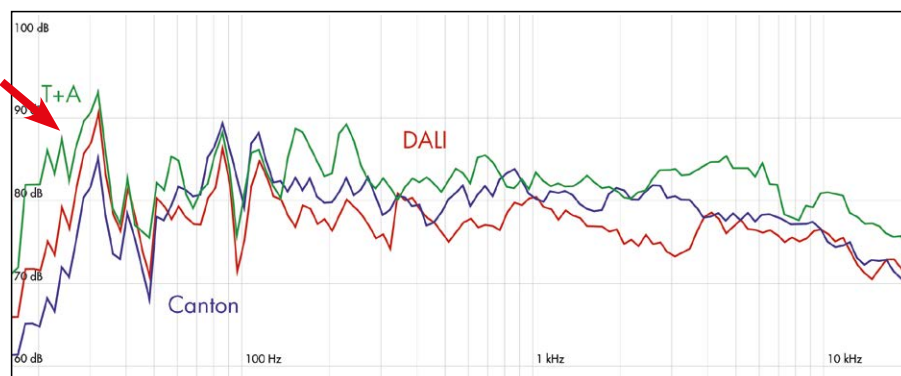
when it comes to AC/DC's hard rock pounder „Back In Black“, which actually roars in the ears when front man Brian Johnson really gets going. However, the speakers are hardly to blame: they're merely mercilessly revealing the weaknesses of the recording. Conversely, with Adèle's impressive re-creation of The Cure's „Love Song“ the T+A can show what it can do: the acoustic guitar sounds natural in the intro, the voice stands wonderfully in the room, and when the powerful bass begins to pump it's impossible to escape the magic.

However, we're curious how the DALI Rubicon 5 – being about half a meter smaller and weighing 15.7 k – will fare. In terms of efficiency it's superior to the T+A, which is quickly apparent with AC/DC, yet doesn't not present the musical structures to the listener quite so well. However, it scores with a very special quality: the silky sound of its hybrid tweeters, which combine an ultra light high-frequency dome with a ribbon for the higher frequencies above 15 kHz. Adèle's sometimes coarse, then again supple, timbre is more effective through the DALI even more: it's more coherent, more intimate. With Tchaikovsky's concerto for piano and orchestra interpreted by Denis Kozhukhin (Pentatone), the strings and grand piano are even more „authentic“ compared to via the T+As (but the latter plays the vast orchestral image in a more transparent fashion).

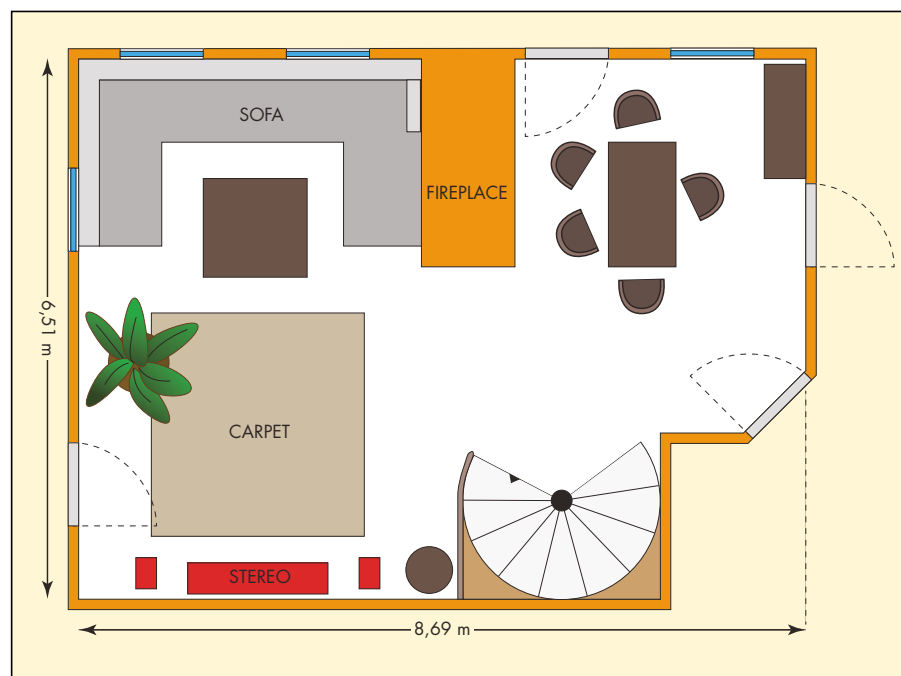
Undoubtedly the DALI Rubicon 5 is a viable alternative to the larger T+A. despite its slim appearance, and which of the two will be preferable is ultimately going to be a matter of personal taste.

Compact speaker, lofty ambitions?

And what about the Canton Vento 830.2? A compact speaker in a two-storey „loft“ is going to struggle, right? Hardly: were amazed how much energy its delivered with our test-tracks: although it cannot hold a candle to the sheer weight of the T+A, the bass drum in „Take Five“ sounds amazingly punchy, and the speaker shows a lot of drive with AC/DC. too. However, it is overwhelmed by the orchestra in the Tchaikovsky concerto, and fails to deliver the power of the musical forces convincingly, while with Adèle it focuses on the chest voice. The DALI Rubicon has a markedly finer effect than the Canton with



▲ The enormous volume of the room show the T+A speakers' advantages: across the frequency range the large loudspeaker puts more energy into the listening room than the smaller speakers. With respect to the bass (arrow) it reveals an entire octave more than the DALI and the Canton.

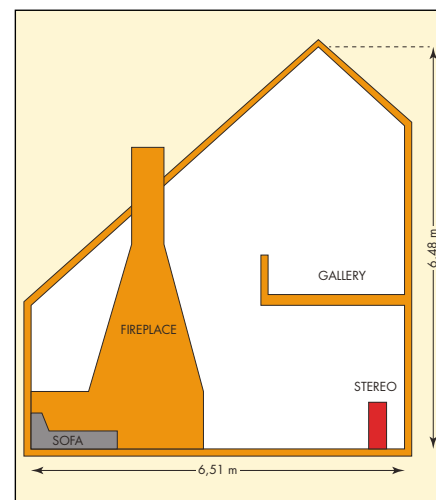


▲ Angled but contiguous: There are only a few symmetries in the spacious living room. A chimney and the spiral staircase ensure good acoustic by further 'breaking up' flat surfaces.

the lingering resonances of the piano, even though the quick, nimble little two-way shows crisp, clean timing.

Space exploration

In our largest listening room there were some unexpected results: while the big T+A was by no means out of the race, for quieter listening the DALI Rubicon is more comfortable, and the compact Cantons brought home a reasonable result. As we anticipated, due to its size this first room created the least acoustic challenge, and made apparent the specific properties of each of the three pairs of speakers. However, hardly anyone has so much space, so how do things work in smaller rooms?



▲ The balcony above the system focuses the sound toward the listening position.

MIDDLE ROOM 25m²



STRICTLY AVERAGE

Even in a living room that seems to conform to the norm, one can experience acoustics surprises.

According to market research, the average living space in German homes is 22 square meters. Our second room probably also resembles that of many STEREO readers in terms of shape (rectangular), decoration and furniture (chest of drawers, hi-fi system and LED screen as well as a fabric-covered corner sofa on the opposite side). In spite of the room's limited size, it conveys a subjectively impression of space, and doesn't feel at all cramped.

However, this feel-good factor exacerbates an acoustic problem which is probably the most common in living rooms: room modes, creating those notorious „standing waves“ travelling back and forth between parallel walls, are particularly pronounced here due to the lack of wall-mounted cabinets or large shelves which

would absorb or scatter reflections. So can this problem be avoided, simply by using compact speakers less able to stimulate the room in the bass area?

A workaround?

We tried the Canton Vero 830.2, but surprisingly its qualities less in evidence here than they had been in the 52 m2 room: while „Back in Black“ and the „Lovesong“ bass and bass drum come through fatter than we'd expected, Adèle's had become unpleasantly sharp, not to mention that of shuddering AC/DC shouter Brian Johnson. Drawing the curtains at the windows and laying a thin rug between speakers and sofa smoothed out this disturbing effect somewhat, but still the Cantons weren't entirely convincing, especially in terms of imaging.

A better match

We were much happier with the DALI Rubicon 5, which we'd expected to be a better match to the room – and so it proved. With Tchaikovsky's piano concerto the instruments were now fanned out better, the musical details clearer, the dynamic differences are shown with more contrast. While the same applies to



▲ Measure first, and then listen, listen, listen: The STEREO editors Carsten Barnbeck (left) and Andreas Kunz (right) listened to selected musical examples again and again.

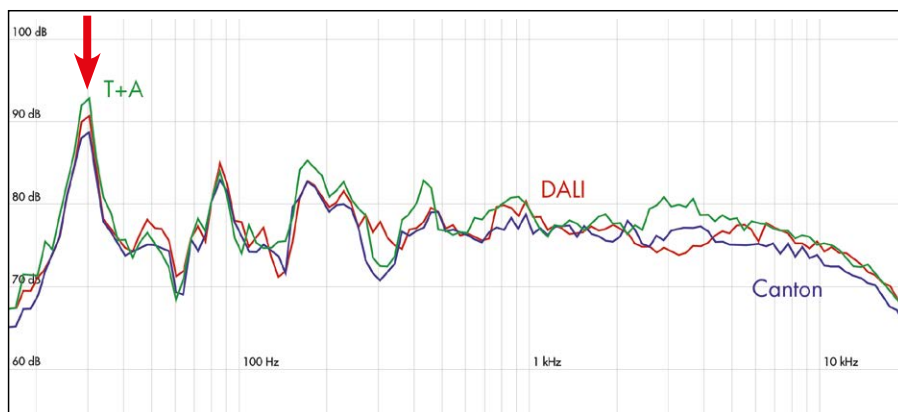
Adèle's „Lovesong“ and „Take Five“, the Dave Brubeck classic reveals a strange phenomenon: when you focus on Gene Wright's playing, some of his bass more perceptible than others, which seem swallowed up.

To counteract this, we connected the T+A TCD 110S in order to access an extra octave of bass reproduction, and at full volume quickly realized why this speaker is considered an „audiophile sledgehammer“. Brubeck and his band seemed to be playing directly in front of us, just like the pianist Denis Kozhukhin in the Tchaikovsky, flying around our ears with massive piano chords, and AC/DC's guitar riffs rumbling like thunder. Inspired by the tremendous sound pressure even the curtain rods and stovepipe are shaking too – it wouldn't be to win over the neighbors as friends!

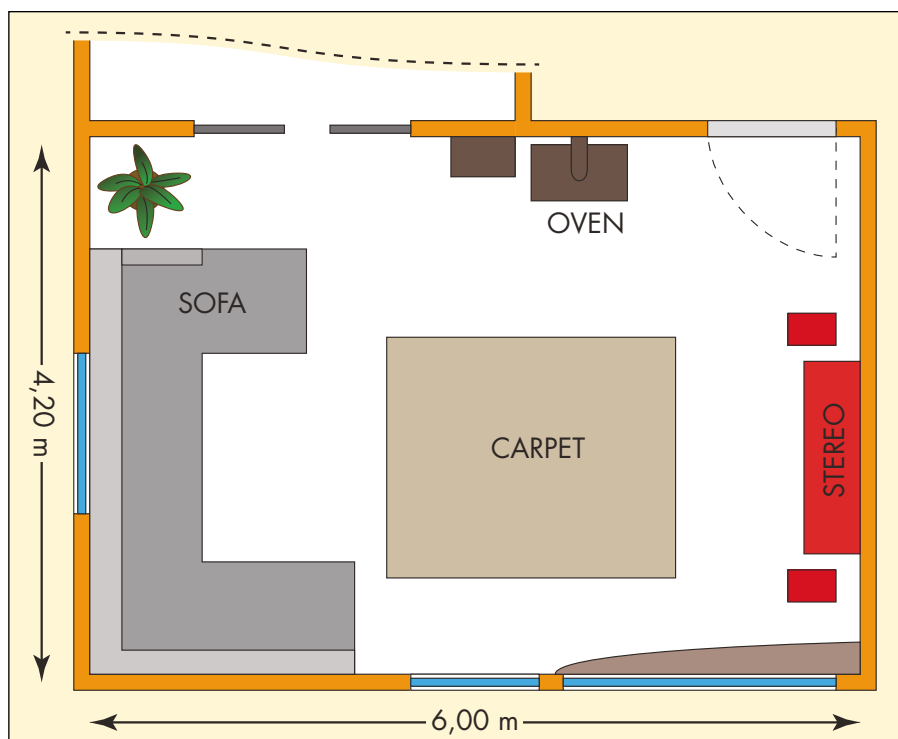
However, despite this enormous power some of the lower bass is still being „swallowed up“. The graphic (top right) shows this: at 60 Hz the T+A is more than 20dB down on its response at 30 Hz!

However, in this room most listeners would still give the T+A preference - if it can be fully driven – especially since in this room there's no booming. Despite the described shortcomings, this space is more than acceptable.

Mind you, the DALI Rubicon also showed its strengths here: the Hammond organ and strings come in more smoothly than with the T+A, and the piano sounds more beautiful. Even Paul Desmond's alto saxophone is less overwhelming in this room, flattering but with a sweeping sound.



▲ In the middle room, all speakers work similarly. The levels at the listening position differ only in smaller details. The pronounced room mode at 30 hertz (arrow) is remarkable.



▲ The room is a clean rectangle with an open passage to the dining room.

GLOSSARY

ABSORPTION

Part of the emitted sound energy is absorbed by surfaces and objects - which is a blessing, because it counteracts with room modes, early reflections or excessive reverberation times. High frequency (and thus short-wavelength) sound can be attenuated by materials with a porous, open fine structure (carpets, curtains, foams, etc.), but in order to damp deep, long-wave sounds, large-volume absorbers, such as closed cabinets, are required.

DIFFUSION

When sound is applied to objects which have a fine structure in the order of magnitude of

the wavelength, the sound of the affected frequencies is diffused in different directions, just diffused. High diffusion is helpful to build up a uniformly mixed sound image, in which no isolated reflections or frequencies are disturbingly perceptible.

ROOM MODES

If integer multiples of half the wavelength exactly fit between two boundaries, they act as resonators. Example: At a frequency of 43 Hz the wavelength is eight meters. With a boundary distance of exactly four meters – whether in the length, width or height of the room - this frequency is dramatically amplified. These room

modes („standing waves“) can create boom in the bass area, and conversely can also cause other wavelengths to cancel each other out – hardly conducive to smooth bass response!

REVERBERATION TIME

This term is defined as the time that elapses until the energy of an impulse has fallen to one thousandth of the initial value. The acoustically ideal reverberation time depends on the room size. If the reverberation time is too long, overlays are produced that smear the focus of the sound image, but too little reverberation makes the room overdamped and „dead“-sounding.

SMALL ROOM 14m²



GREAT THINGS IN SMALL SPACES

HiFi in small rooms is an explosive topic, simply because acoustic problems are often the most disturbing. Is that the case here?

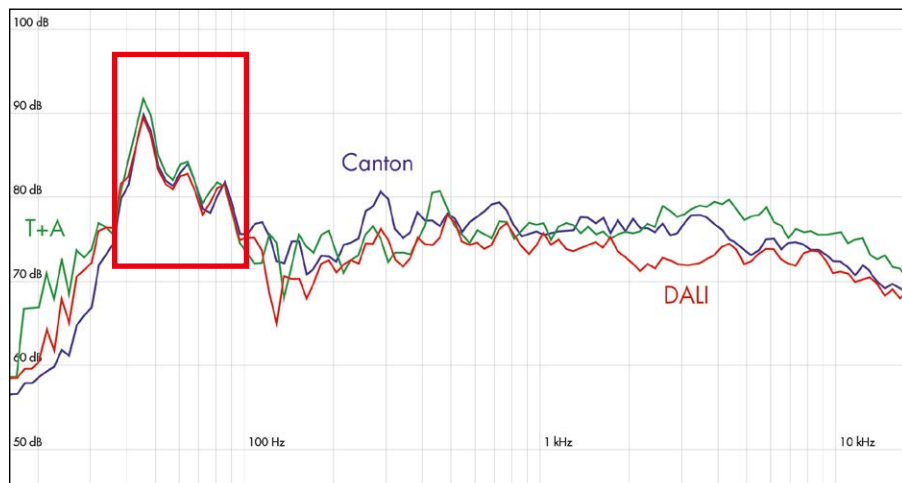
The crime-scene? A small room. The offence? Bass waves, needing a lot of space to unfold, hemmed in and showing their displeasure. Will a first-class loudspeaker like the powerful T+A TCD 110S be able to unfold its potential – or will it, and we, just drown in uncontrollable bass?

We'll play it safe at first, with the compact Canton – which, as expected, has the best control of the 14-square meter room, even in the low frequency ranges. The double bass is clean and precise in „Take 5“, and Adèle's „Lovesong“ grabs the listener when Hammond's organ, bass and drums come in after the first verse.

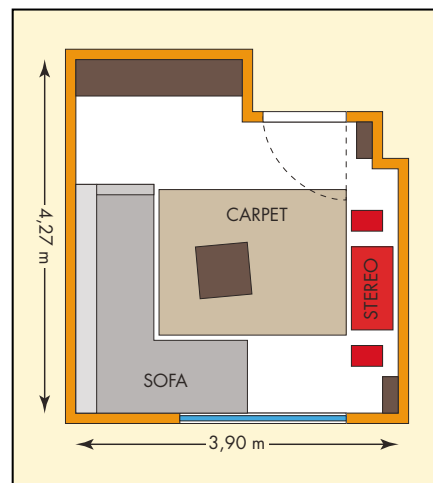
Musical structure is easy to understand on all tracks, from rock and pop to jazz or classical and – except for AC/DC's hard rock, the music comes out clean. Perhaps one would want more silk in the strings with the Tchaikovsky piano concert, but enough complaining – the Vento 830.2 creates a great mood in this living room!

Floorstanders a no-no?

Does this performance therefore mean floorstanders are a no-no? We listen carefully to DALI Rubicon 5, and again we are surprised: the speakers are by no means acoustically oversized. On the contrary, compared to the Canton they win with each piece of music: with AC/DC it's mainly the more comfortable treble, with



▲ Lots of energy in the room: In the smallest test room, all speakers produce too much bass. This emphasis applies to the wide frequency range of approximately 40 to 90 hertz (frame).



▲ Almost square, the space is only interrupted by a niche (top).

„Take Five“ a more charming alto saxophone. Adèle's voice is supple and powerful, and the slightly thicker upper bass on the track livable-with, while the success of Tchaikovsky's concerto for piano and orchestra is particularly striking: the strings are creamier, the basses more agile, and the overall impression warmer.

Despite its size, this loudspeaker (around 1500 euro more expensive than the Canton!) is ideal in this small space. As anticipated it turned out to be a great all-rounder, able to prove its tonal beauty in all listening situations.

And the T+A fireballs? Well, they performed amazingly well! „Lovesong“ was a bit thickened in the midrange and bass, but „Take Five“ convinced with a great sound and AC/DC's „Back in Black“ was captivating without any unpleasant „side effects“, making this a loudspeaker that really fills the listener directly. Yes, you need to stick to moderate playing volume (full level's not recommended in this room!), but the quality of the design shines through.

True, the acoustics of the room have some very mild optimizing measures:

the corners, where the dreaded room modes are particularly strong as several pressure-increasing boundaries meet, are diffused by shelves or sofas placed there, while the cork-clad wooden floor also supports a balanced sound by preventing too hard reflections and a carpet helps, too.

Nevertheless, it's astonishing that in this room all the speakers on test can prove their qualities - even if with some restrictions. Clearly trying is better than studying, and so we wish you every success in your own experiments with different loudspeakers!

CONCLUSION

We can roughly summarize the fact that many hearing impressions confirm our previous assumptions.

A compact loudspeaker has to make more effort to release sound energy and is therefore subject to audible limitations in medium and large rooms. On the other hand, the big T+As were a problem in the smallest of the three test rooms: as soon as we wanted to drive TCD 110 S harder in the 14 square meter space, it sounded like an impetuous headphone. On the other hand, DALI's compact floorstander presented itself as a good compromise in all environments.

However, with such a simplified presentation, one should be careful, as it excludes the individual taste and the personal sound. An ideal example of this is provided by the T+A speaker: as long as we were careful with the level in the small room, the speaker behaved itself and was characterized by its enormous detail, while the deep roar of its bass drivers reminded us what incredible energies can be unleashed in such a small space. Such an exotic

loudspeaker selection may seem strange at first, but if you were looking for extreme dynamism, power, and the feeling of building your listening space around the loudspeaker, then even this combination would be tempting.

Canton's 830.2 also demonstrated its qualities in each of the three environments - even in the big 52 square meter space. Manage your expectation of every bass impulse going deep into the pit of the stomach pit, and the way the Canton plays in the big room demonstrates its superb timing, precision and musicality. In short, our auditory impressions indicate tendencies, but cannot act as laws.

Each loudspeaker has a close relationship with the listening room and therefore, regardless of its sound when heard „dry“ in a room without its own characteristics, it sounds different in every environment. This is even the case when selecting rooms that have been optimized so that their reverberation times are nearly identical.

Practically all speakers have slightly different characters in the small (24 m²) and large (42 m²)

STEREO listening rooms, meaning that for each test we have to decide in which room to make the final evaluation.

Bear in mind, therefore, that a speaker you like in a dealer's demonstration room won't automatically sound just as good at home: listening in your own room, if possible, is the only way to be sure.

But there are a few rules of thumb, based on the basic task of a speaker, which is the conversion of the current energy of the amplifier into sound pressure. Large boxes shift a lot of air, and smaller ones rather less, which is why the speaker must basically correspond with the room size. Owners of rooms of 20 to 35 m² have it easy - all designs seem to work well in that kind of space.

Special care must be taken if the room - like our middle room - has a bass problem. Then the rule is: if you only have a little bass, it cannot make any big headaches. Compact loudspeakers and smaller floorstanding models can solve the problem.

TRANSFORM ROOMS INTO CURVES

Ultimately, in the acoustic assessment of a room, only two things count: hearing and personal taste.

Nevertheless, it was interesting to see whether the collected impressions could also be demonstrated by measurements. Since the equipment should be as mobile as possible, our choice fell on the iPad version of DSP Mobile's „Analyzer“ (around 15 euro), which adheres strictly to all valid standards and specifications. In addition, the manufacturer offers correction curves for different microphones (each for ten euro), including our i436 from MicW (around 125 euro). Despite the ultra-compact dimensions, this is a superb capsule with spherical characteristics. Like our ears, it captures the entire ambient sound – an indispensable prerequisite for meaningful room measurements.

If you are familiar with the loudspeaker diagrams in our test profiles, you will notice that the room measurements in this article look completely different. For our product tests, we're concentrating on the performance of the speaker, and so use a microphone with directional characteristics, placed one meter away from the box. Spatial acoustics do not play any role in this type of measurement, so the frequency response is free from external influences. In measuring the effects of the rooms, however, those external influences take centre stage.

The i436, on the other hand, was located on a tripod directly at ear level at the listening position during the measurements, the speakers having previously been set up and angled so they played optimally. The resultant curves thus form the complex interplay between the loudspeaker and the room. The test signal, amplified by Symphonic Lines RG 9 HD (around 7100 euro, test in STEREO 3/14), always had a level of exactly 80 decibels at 1 kilohertz. Although all three rooms have a good basic acoustics, none of our measurements came close to „linearity“. Even we were astonished that between the highest peaks and the valleys caused by spatial modes could be up to 30 decibels, and amazed by the fact that there were differences in the loudness of the loudspeakers despite the calibrated level.

This is where the most important difference between loudspeaker and room measurements comes into play: if you give a short sound pulse into the room, say 10

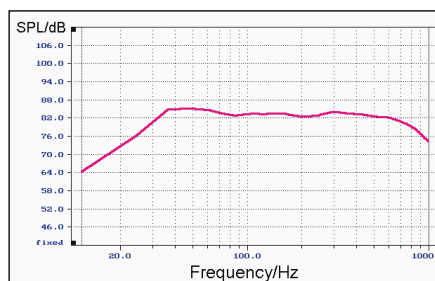
milliseconds, it can be heard longer. The impulse spreads throughout the room, is thrown back from the walls, and sometimes lasts hundreds of milliseconds, although its reproduction has long since finished. The more energy an impulse has, the longer it is normally audible, which is why the effects of such reflections are particularly



▲ We placed the microphone at ear level directly at the listening position to capture the room acoustics.



▲ The iW36 ball head from MicW proved to be a reliable mobile measurement companion.



▲ Speaker reference measurements (left) are free of space influences. Only on the listening position (right) can one recognize the massive influence of room mode and reverberation.

noticeable in the basses. Reverberation is problematic, since it gives the frequencies temporal scope to overlap each other, cancel each other, or sum up, but on the other hand, we find totally dead spaces unnatural, simply because the world's not like that. The optimum is somewhere inbetween.

The influence of reflections and reverberation - and thus of the room - is captured via adjustable „measurement windows“.

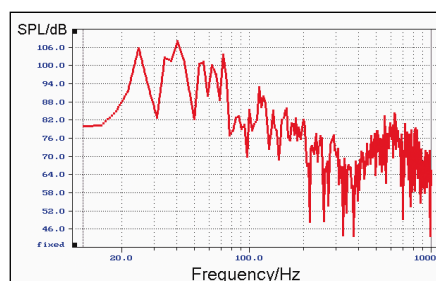
What exactly is RT 60?

For example, if a program such as Analyzer registers an 800-kHz pulse at 86 decibels, it will observe this frequency until the signal decays to one-thousandth of its original volume. The measuring window is then closed and the impulse is terminated. Sum effects such as mutual extinction of frequencies can only be captured in this way. The reduction to one thousandth corresponds to a reduction in the level of the sound by 60 dB. Together with the abbreviation of the English word (reverberation time), this results in the RT 60 standard, which is valid today for all room measurements.

AND WHAT DOES ALL THIS MEAN?

One should be careful with the evaluation of such data. Massive peaks in the bass allow a room to boom too easily, but if such peaks are directly next to two large frequency holes, this exaggeration can save the bass reproduction. Such overlapping effects can make the acoustic problems imperceptible in all frequency ranges. Conversely, even the smallest frequency breaks in critical areas can cause us to perceive voices and instruments as unnatural.

As already mentioned at the beginning, in the end it's our hearing – and individual taste – that counts!



T+A Updates Multi-source Player

The MP 3100 HV is the new combined CD/SACD player, network player and D/A converter from T+A. As well as improving the CD drive with the latest decoder and error correction technology, as well as shorter access times, T + A has also updated the network module: it accepts lossless formats up to 24 bit/192 kHz, and provides access to Tidal, Deezer and Qobuz. It also provides gapless playback of MP3, WAV and FLAC files. As a D/A converter, the MP 3100 HV accepts digital signals in all standard forms via the USB port – up to 384 kHz PCM and DSD bit currents up to 22.4 MHz. PCM and DSD data pass through separate converters, the T + A having a „true 1-bit converter“ for DSD. There is also Bluetooth with aptX, WLAN, and an FM/DAB + tuner, and the MP 3100 HV can be operated with the supplied radio remote control or the T+A Control App. The 26-kilo device should be launched on the market in mid-April for 13.500 euro.



www.ta-hifi.de

NAD combines M50 and M52 to create new music server

Four years ago NAD launched the M 50 CD player/ripper/streamer M 50 and the partnering M52 hard drive module; now the two have been combined in the M50.2. With two 2TB hard drives in Raid configuration, it's now available in the German market for around 4500 euro and, while it still doesn't provide analogue outputs, it allows an external DAC can be connected via USB, S/PDIF, AES/EBU or HDMI. New to the M50 is integration into the BluOS multiroom system, meaning music can be reproduced wirelessly via Bluesound all-in-one speakers and other BluOS components, while BluOS also provides access to streaming services including Spotify, Tidal, Deezer, Napster, Juke and internet radio. A Bluetooth receiver with aptX is also included. The M50.2 can play CDs or rip them fully automatically onto its hard disk, and also access music from a home network at up to 24bit/192kHz.

www.nadelectronics.com



Sound United takes over the D+M Group

The D+M Group, which includes Denon, HEOS, Marantz and Boston, has been taken over by Sound United, the parent company of Polk Audio and Definitive Technology. Sound United is the market leader in loudspeakers in North America and the leading provider of sound bars and wireless music systems, and the newly expanded company will retain its name. While the acquisition is expected to deliver „synergies for the existing core business and at the same time potential for the expansion of the product portfolio and the respective market shares,“ it's said the individual brands should „remain highly differentiated in the market“. Sound United is part of DEI Holdings, which in turn is owned by Boston-based private equity firm Charlesbank Capital Partners, LLC. In Germany Sound United and D + M have been working together for several years.

www.soundunited.com



STEREO MAGAZINE NEWS

Finnish Flagship with Passive Membranes

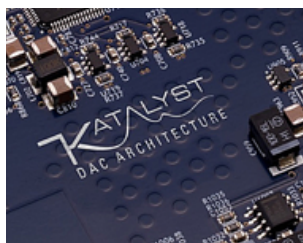
Finnish loudspeaker manufacturer Amphion has further developed its Argon 7L loudspeaker: the top model of the Argon family, now called the 7LS, has been equipped with passive membranes for a more precise, timely bass reproduction. Manufactured entirely in Finland by the company, which has also built a reputation as a supplier of studio speakers, the 7LS is available in black or white for 2250 euro per unit, or 2400 euro apiece in walnut veneer, with a choice of 9 different colors for the driver grilles.

www.amphion.fi/



Linn: Klimax 350 with Katalyst DAC

The optimized fourth-generation converter technology from Linn, known as Katalyst, premiered in the Klimax DS and Klimax DSM network players and is now also available in the Klimax 350 active speakers and the Klimax Exaktbox external digital crossover. The main features of Katalyst include a reference voltage source shielded against interference, separate power supplies for each signal process - even for the high-precision clock - and a newly-developed analogue output driver. Each of the six channels in the Klimax 350 is powered by its own Katalyst DAC and power supply. Partnered with external power amplification, the Klimax Exaktbox brings Linn's Exakt technology to passive Linn speakers and selected third party models (including the B & W 802 Diamond, KEF Reference 3 & 5 and PMC twenty.26). The Exaktbox is 14.300 euro, while the Klimax 350 loudspeakers are priced at 58.950 euro per pair, in a choice of real wood veneers and varnishes. Existing Klimax 350s and Klimax Exaktboxes can be upgraded to the new technology.



www.linn.co.uk

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OD NEWS

Universal Music Supports MQA

The corks are popping for Bob Stuart, the inventor of the MQA format: after Warner Music announced a range of MQA release, Universal Music Group is now also on board. A press release from the two companies announces a multi-year agreement has been made to encode Universal's extensive catalogue of



master recordings in MQA, making some of the most famous albums in the world available for 'studio quality' streaming for the first time. When and where the first Universal albums will be available in HiRes was not disclosed, but it can be assumed that they will appear at Tidal, as well as via HiRes download stores. The move means that of the major label groups, only Sony Music hasn't signed up to MQA – but then Sony always likes to go its own way.

www.universalmusic.com

New Cables from Cardas

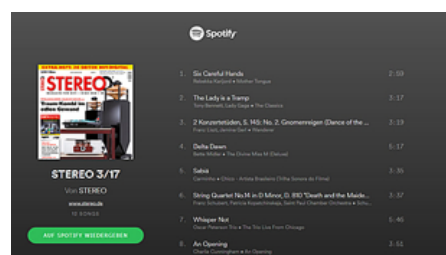


There is a new cable series from US company Cardas Audio: „Iridium“ replaces the „Microtwin“ and „Twinlink“ series, and is based on „cross“ cable technology. Four inner

conductor bundles are used, consisting of individually varnished strands twisted in opposite directions, while PFA tape with carbon impregnation is used for positioning and a spiral cable serves as additional shielding. Keeping the cable very flexible is an external 'jacket' of thermoplastic elastomers. Made in the USA, Iridium is available as RCA or XLR cables (from 260 euro), phono cables (from 250 euro) and speaker cables (from 250 euro/pair).

www.cardas.com

STEREO Spotify Playlist



From now on STEREO presents recommended tracks, from albums rated as excellent in the music section, on Spotify every

month. The STEREO playlists invite you to enjoy a variety of styles, from rock and pop to world, and from jazz to classical music, so come with us on a voyage of discovery:

<http://bit.ly/stereomagazin>

Sonus Faber Renews Homage Series



Italian loudspeaker manufacturer Sonus Faber is introducing four new models as its "Homage Tradition" line, combining particularly luxurious materials and component quality. The „Guarneri Tradition" is a compact two-way loudspeaker with a carbon pedestal at 14.900 euro per pair; „Serafino Tradition" is a 3.5-way floorstanding loudspeaker at 19.900 euro/pair; and „Amati Tradition", is a larger 3.5-way floorstander at 26.900 euro/pair. The price of the „Vox Tradition" center speaker, which is due in May, is not yet fixed.

www.sonusfaber.com

The „externally triggered" loudspeaker under a new guise

The specialty of speaker developers Wolf von Langa is creating the magnetic field of its drivers not with a permanent magnet, but actively with so-called field coils. These „externally triggered" drivers are used in Langa's new four-strong „Audio Frame X" line, with different variants of the field coil chassis meaning the models are named after the place of residence of the inventors of the respective driver technologies: „London", „Chicago" and „Berlin". The top models – „Berlin" and „Berlin II" – include the concentrated Field Coil technology from Wolf von Langa and two horn drivers using the design of Friedrich Rösch, from Berlin-Steglitz. The „Audio Frame X" models can be seen and heard at the High End in Atrium 4.2 Room F231c, where the inventors will also be present.

www.wolfvonlanga.com



2000W Subwoofer from Bowers & Wilkins

In April, Bowers & Wilkins launched its new „DB" Subwoofer Series, the flagship „DB1D" (4800 euro) including two horizontally-opposed 30 cm drivers, powered by 2000W of amplification. The two smaller models are the DB2D (3700 euro) and DB3D (2650 euro), and the subs use the „Aerofoil" speaker cones designed for the company's 800 Diamond Series speakers, so-called for their variable thickness wing-shaped radial cross-section, keeping them both very stiff and exceptionally light. „Dynamic EQ" and „Room EQ"



allow the subwoofers to the room and the installation location, under the control of an app for Android and iOS. The DB subwoofers are available in high-gloss black, satin-white and rose nut (walnut red).

www.bowers-wilkins.com



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Dynaudio Reactivates its Focus

Dynaudio's „Focus XD“ series of active speakers moves into a new generation with revised DSP software for crossover optimization and refined room-tuning for greater accuracy. The boxes can be optimized for free-standing, close-to-wall and square-mounted installation, and the speakers can be



connected using line analogue or S/PDIF. They are available in silk-matt white or, for an extra charge, in high-gloss black, high-gloss walnut and high-gloss rosewood. The series starts with the compact Focus 20 XD (from 5500 euro per pair), and goes up to the 30 XD and 60 XD floorstanders, from 8500 and 11,000 euros per pair respectively.

www.dynaudio.com

STEREO MAGAZINE NEWS

Bluesound Becomes RoonReady



With the arrival earlier this year of its latest firmware, 2.10, the Bluesound multiroom system is now suitable for Roon. This means the devices are now recognized as „RoonReady streaming endpoints“. Bluesound devices – as well as models from stablemate NAD fitted with the „BluOS“ module – can now also be controlled directly by ELAC's „Discovery“ music server. In addition to the firmware update, an updated version of the BluOS Controller App for smartphone, tablet and PC is also available for download.

www.bluesound.com

Power or Emotion?

With the OCTAVE V110SE integrated amplifier, you can have both!

The OCTAVE V110SE integrated amplifier delivers both, allowing listeners to enjoy the beauty of music with natural and complete tonal accuracy. This most refined tube amp features an innovative adjustable damping factor, allowing an optimal match to the partnered loudspeakers, regardless of type. Complementing the high-end sonic perfection is the vast amount of power on hand, with 110 watts per channel of pure tube power providing authoritative control of even the most demanding loudspeakers.



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DIAMOND STAR

STEREO exclusively tests the Bowers & Wilkins
anniversary model, at 30,000 Euro a pair.

There is no doubt that the Bowers & Wilkins 802 D3 is both fascinating and breathtaking: a fantastic loudspeaker, at €22,000 offering everything even the most demanding listener could want from a domestic design. In fact, it's so good we doubted it could be surpassed – yet now it takes second position in the range behind the 800 D3, selling for € 8,000 Euro more per pair, and at first glance apparently the same size.

Indeed, the differences between the two are really only apparent when the two models are placed side by side – as here in the STEREO listening room. The 800 D3 has 0.5cm(!) more shoulder height, larger woofers, and a slightly increased internal volume. Why? Well, that answers itself when you listen to the two against and next to each other, and discover the question is as superfluous as wondering whether the BMW 5 series or Audi A6 are so great that a 7 series or A8 are superfluous.

In Worthing, England, where the 800 Series Diamond speakers are made, this step-up model was always planned, but its launch was delayed for two reasons: first, the company had unprecedented demand for the models from 805 D3 to 802 D3, which were introduced in the Fall of 2015; and second, the 800 D3 had a further function as the symbol of the company's 50th anniversary in 2016.

The 800 D3 requires, in addition to the greater investment, a bit more amp power to reveal its ability to communicate, and a slightly larger room – although, in view of its target audience, that last requirement may well be less of a problem. The 800 D3 is a full-fledged transducer, with neither the lower frequency extension – below 20Hz – nor the maximum level on offer showing any signs of “room for improvement”. And though not small, the speaker won't challenge aesthetically-demanding housemates: its appearance is sculptural than primordial.

Powerful subwoofer

In our opinion, this flagship promises more authority for an acceptable surcharge: yes, it might go a bit deeper in the bass range, and perhaps offers a few decibels more maximum level as well as an increased level of efficiency – physics is physics, after all! However, the focus is

not on these anticipated improvements or even on the functional specifications, since the 802 D3 was hardly found wanting in these areas: instead, the increased woofer surface-area is there to reduce the required cone movement, and thus minimize distortion. And those minimal distortions, which have an effect well into the mid-high range, not only ensure clarity even when the speakers are playing at high levels but also ensure striking depth and definition – areas in which the 800 D3 speakers have no match.

It goes without saying that the 800 is full of technical goodies; but then no other loudspeaker manufacturer has a comparable “University Of Sound” (located in Steyning, not far from the production facility) with so many employees: here the company not only does pure research, but also addresses all the basics of its speakers.

For example, the famous Bowers & Wilkins midrange driver, with its eye-catching Kevlar cone, has now been replaced with a new diaphragm material the company calls Continuum. Its exact construction is still shrouded in mystery while patent applications are in hand, but surface is soft and yet stiff, and offers less distortion. The reason for the change after all these years is simple: having tried long and hard further to increase the performance of its Kevlar midrange driver, the engineers simply found a material with better performance.

Actually, ‘simply’ undersells the process, as this new cone is the result of a very long period of research and development, and we can report that the change has paid off: the sonic characteristics sometimes ascribed to Kevlar have now disappeared.

Improvements in the series

And the driver itself isn't the only change in the midband: as in the other ‘headed’ models in the series, the 803 D3 and 802 D3, the flagship sees the replacement of the Marlan head, whose material came from high-grade bathrooms and was once considered to be near-perfect in acoustic terms. The new head housing the midrange and supporting the tweeter's Nautilus tube is made of aluminum not only

KEYWORD

Matrix:
B&W's complex inner frame to increase stiffness and reduce resonances in the loudspeaker housing.



similar to that used in the construction of engines, but actually developed in cooperation experts at Rolls-Royce, whose Goodwood 'factory inside a hill' is nearby the Bowers & Wilkins plant. Described as the 'Turbine' head, it's machined from a massive casting, integrated into which is propeller-like radial bracing to minimize both vibration and resonance.

A further technology highlight is the diamond tweeter, which is in fact one of the few elements carried over unchanged from the previous design, and is housed in a new, higher-specification version of the company's famous Nautilus tube, so that unwanted rear-radiating energy is meticulously damped out.

Operated by immensely powerful motors, the long-throw woofers feature innovative Aerofoil membranes, varying in thickness across their radius to deliver stiffness without weight gains, thus allowing a precise pistonic motion and avoiding distortion.

They're mounted in a larger version of the bass reflex housing used for the other 800 Series Diamond floorstanding models, with a completely reworked version of the company's Matrix construction of internal bracing, designed to prevent resonances and standing waves: compared to previous versions, less material has been used without impairing the stability, gaining internal volume for bass response. Metal is used to reinforce the structure, and also form a stable platform for the two woofers, while the speaker sits on a hefty solid aluminum plinth, complete with the combination of castors for ease of positioning and high-quality – and very sharp! – retractable spikes.

Like other speakers in this series, the 800 D3 uses the 'reverse wrap' cabinet design, in which the whole of the front and sides of the enclosure is pressed as a single piece, using very thin leaves of wood and massive presses installed in the Worthing factory. That's a change from the previous generation, which had a separate baffle mounted to a curved one-piece 'sides and rear' molding; the new version gives much greater structural integrity, reinforced by a slender aluminum 'spine' that supports (and provides a heatsink for) the speaker's crossover.

Like everything else here, those electronics are built on the grand scale, complete with extremely low-loss inductors and



**THE APPEARANCE OF
THE EXCEPTIONALLY STABLE
AND BEAUTIFULLY CRAFTED
B&W HOUSING IS THAT OF
A SOUND SCULPTURE.**

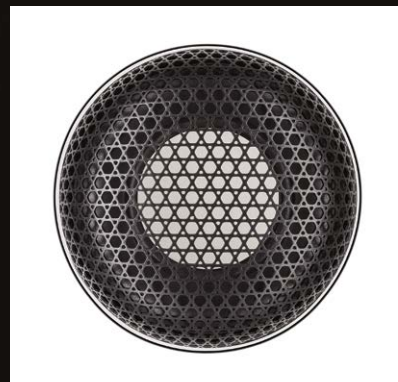
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**SEEN FROM ABOVE THE
NEW B&W IS A BEAUTY – AND
SOUNDS GREAT TOO.**
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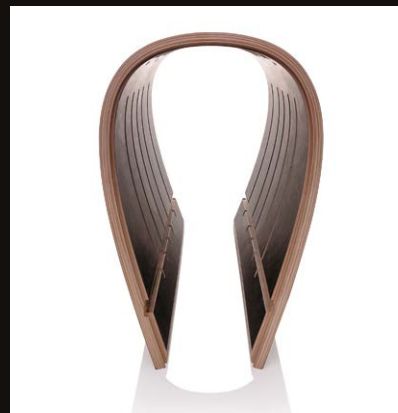
▲ The turbine-shaped aluminum construction was designed in cooperation with Rolls Royce.



▲ The new long stroke woofers with Aerofoil membranes operate very precisely.



▲ The dome tweeter is made of diamond, the stiffest material in the world.



▲ The multilayered housing has acquired an acoustically beneficial curved form.

capacitors from the renowned Cologne company Mundorf, as always chosen by the Steynning engineers after extensive measurement and listening tests.

I have rarely heard a loudspeaker give such an excellent, effortless display, even finer than the excellent Symphonic Line RG Reference HD: the sound was so exciting that several of STEREO's editors were overwhelmed with spontaneous joy! Driven by electronics from Accustic Arts, or Octave's HP 700 SE preamp with the company's largest monoblocs - in a previous test, I reported that the first (Nautilus) 801 really flew with the tube electronics from Karlsbad - the performance of the incomparable 800 series took on an almost supernatural quality in the way the speakers breathed life into the space. The sound detached itself from the speakers, and took on truly three-dimensional presence.

No fault could be found either in the tonal or in the imaging qualities here, for instance with Norah Jones for instance: the timing is exemplary, as is the sense of soundstage depth and focus, but beyond that precision there is real sense of intuition, charisma and emotion. Feet instinctively tap to Eric Clapton's "Tears In Heaven" - a sure sign for superior sound and well over average musicality - here is no doubt that the fine resolution of these loudspeakers is world-class. Indeed, it has to be heard to be believed, as some comparable designs cost twice as much.

The impressive 802 D3 therefore trails its (slightly) larger stablemate in a direct comparison: in the individual criteria such as micro- and macro-dynamics, imaging and bass control the two may seem close, but in the sum the 800 clearly pulls away. It plays orchestral tutti such as Strauss' "Also sprach Zarathustra" - not to mention Pink Floyd's helicopter in "The Wall" or AC/DC's "Thunderstruck" - seamlessly and totally convincingly, not to mention in an entirely breathtaking fashion. In essence, this is all the speaker you will ever need.

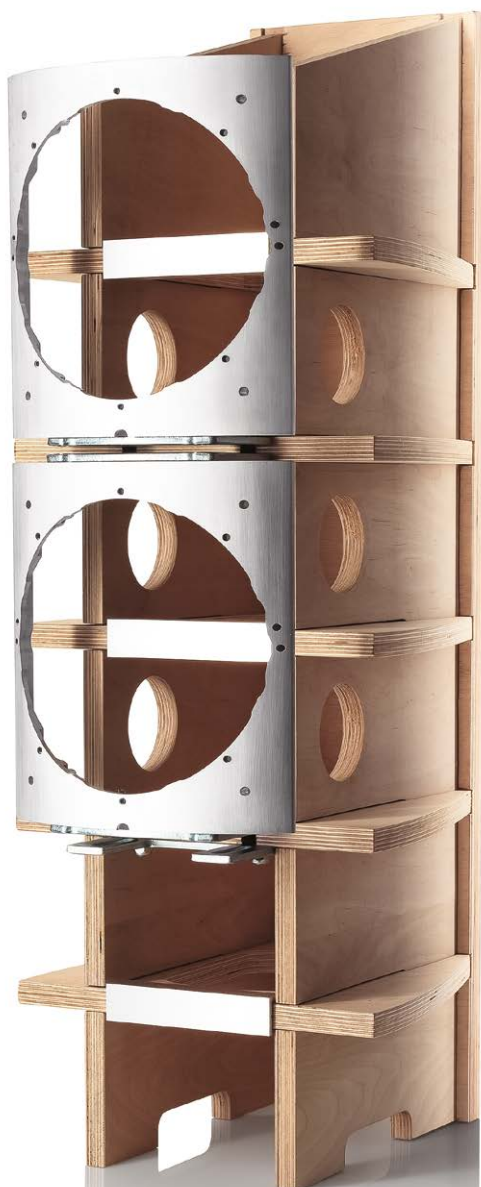
Music extra class

These sound experiences are rare even for an established STEREO editor with 40 years of hifi history, and I became fond of this speaker. I moved the massive crates; unpacked the speakers (all 116kg apiece!); was present for the measurements and photography; carefully installed the pair in the listening room; and spent days sounding them out with changing electronics and enjoying it. And it is clear this is a design immediately able to perform at the highest level, and reveal every change and improvement in the system with which it is used.

Describing the new 800 D3 as just another top loudspeaker would be falling short of the truth: it's way beyond that - and therefore, inevitably, STEREO's reference of the moment!

Tom Frantzen

◀ The redesign of the Matrix construction stabilizes the 800 series like a frame - and allows the direct mounting of the drivers to the internal structure

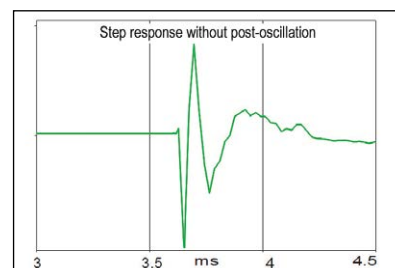
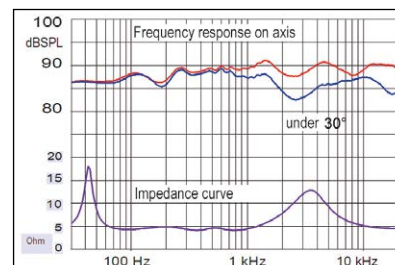


B&W 800 D3

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Dimensions: 41,3 x 121,7 x 61,1 cm (WxHxD)
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This brand new flagship, launched just in time to celebrate the company's 50th anniversary, is the best B&W of all time, and one of the best loudspeakers STEREO has ever tested. Incredibly good!

MEASUREMENT RESULTS



Nominal impedance	4 Ω
Minimum impedance	4,4 Ω at 840 Hertz
Maximum impedance	17,5 Ω at 44 Hertz
Nominal sound pressure (2,83 V/1m)	91 dB SPL
Output for 94 dB (1m)	4 W
Lower frequency limit (-3 dB)	<20 Hertz
Harmonic distortion at 63 / 3k / 10 Hz	0,3 0,1 0,1 %

LAB COMMENTS

The deep reaching frequency response of the large B&W is still balanced, but typically somewhat less smooth than assumed after the listening test. By definition, B&W relies on low-loss, less low-cut filters than on linearization at any cost since the room acoustics will also have an effect. The loudspeaker ought to be slightly toed-in toward the listening position and shouldn't be operated too near to walls in middle-sized or large rooms over 25 square meters; the efficiency is above-average; the timing too. The impedance is easy-going and distortion extremely low.

STEREO-TEST

SOUND QUALITY	100%
PRICE/PERFORMANCE	
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EXCELLENT	

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There are many approaches to reducing the noise associated with AC power—conditioner-filters, regenerators, isolation transformers, battery inverters, and more—and all can yield meaningful results. However, some of these techniques also cause ringing, current compression, and non-linear (obnoxious) distortions. **Some cures are worse than the disease**—some are not as good as plugging straight into the wall.

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AudioQuest invites you to experience the proof that Garth has successfully advanced the art, the science, and the efficacy of power conditioning. We believe that by adding a Niagara 7000 or Niagara 1000 to your system, you'll experience **clarity**, dimensionality, frequency extension, **dynamic contrast**, and **grip** that your system was just waiting to reveal.

Sincerely, Bill Low

"The Niagara 7000 better resolved fine detail and threw a deeper, more expansive soundstage.... Transients of the struck notes sounded faster, less thick, more naturally expressed through the Niagara, as did the length of the notes' decays."

—Michael Fremer, *Stereophile*, February 2016



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HELLO MUSIC

d-tc - the flagship line of products from Ansuz Acoustics. The series consist of a full cable loom and a range of mechanical decoupling devices.

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The performance is stellar. There is simply less filter between you and the music. The micro details are simply better preserved and presented to you in a natural way that leaves you stunned that a cable can have such a stunning influence on the performance of your system.

